



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

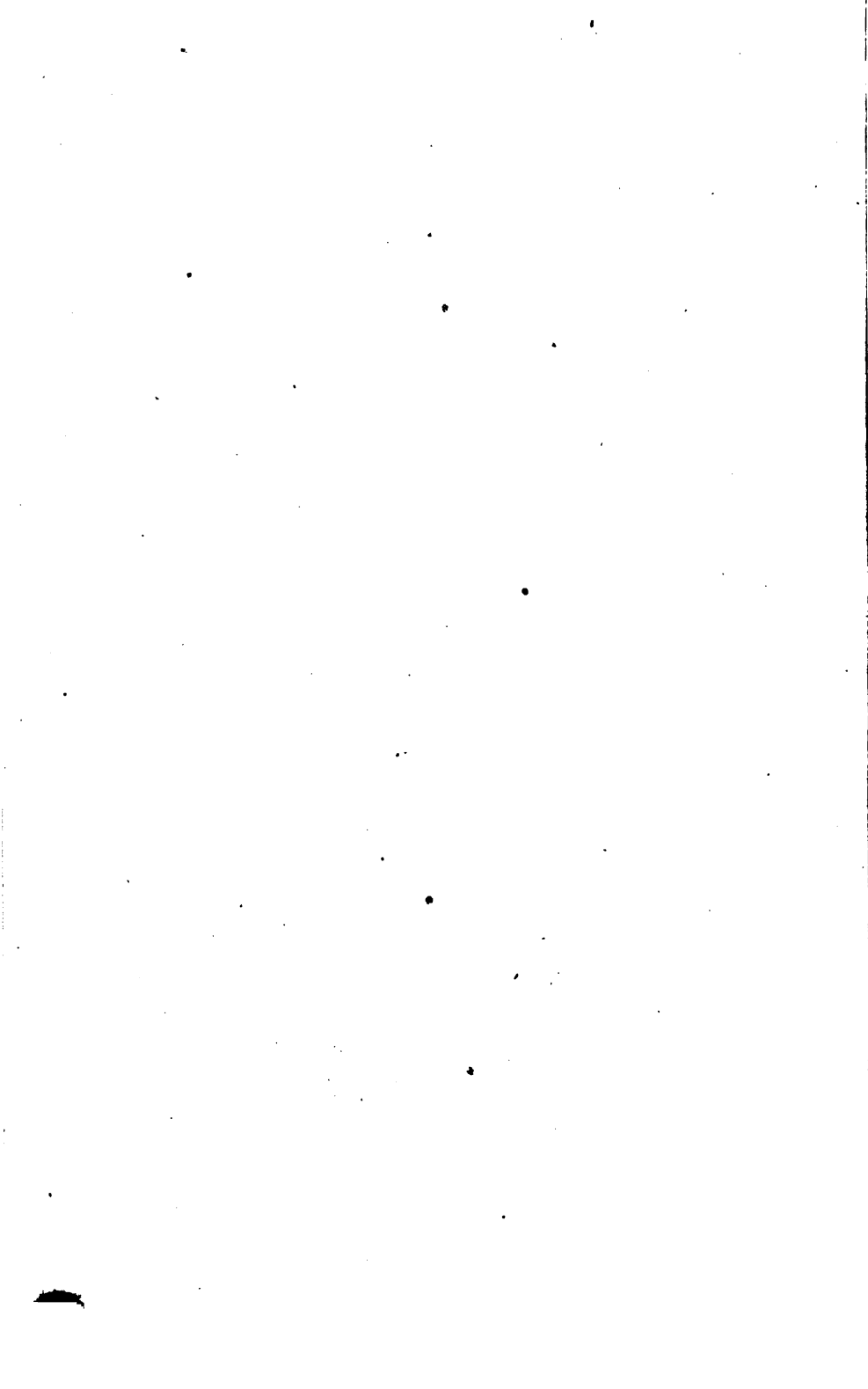
LIBRARY

UNIVERSITY OF
CALIFORNIA
SANTA CRUZ

UNIVERSITY OF CALIFORNIA
LIBRARY
BRANCH OF THE
COLLEGE OF AGRICULTURE
DUPLICATE

LIBRARY
UNIVERSITY OF
CALIFORNIA
SANTA CRUZ





BIENNIAL REPORT

OF THE

STATE BOARD OF HORTICULTURE.

1884.

Office: No. 40 California Street, San Francisco.



SACRAMENTO:

STATE OFFICE JAMES J. AYERS, SUPT. STATE PRINTING.

1884.

S
39
A331
1882/84

OFFICERS AND MEMBERS OF THE BOARD.

ELLWOOD COOPER, President.....Santa Barbara
Commissioner for the Los Angeles District.

S. F. CHAPIN, Vice-President.....San José
Commissioner for the San Francisco District.

GEN. M. G. VALLEJO, Sonoma.....Commissioner for the Sonoma District

HON. H. C. WILSON, Red Bluff.....Commissioner for the Sacramento District

G. N. MILCO, Stockton.....Commissioner for the San Joaquin District

WM. M. BOGGS, Napa.....Commissioner for the Napa District

N. R. PECK, Ophir.....Commissioner for the Nevada District

DR. EDWIN KIMBALL, Haywards.....Commissioner for the State at large

HON. A. F. CORONEL, Los Angeles.....Commissioner for the State at large

A. H. WEBB, Secretary.

S. F. CHAPIN, Inspector of Fruit Pests.....Post Office Box 996, San José

Office of the Board:

NO. 40 CALIFORNIA STREET, SAN FRANCISCO.

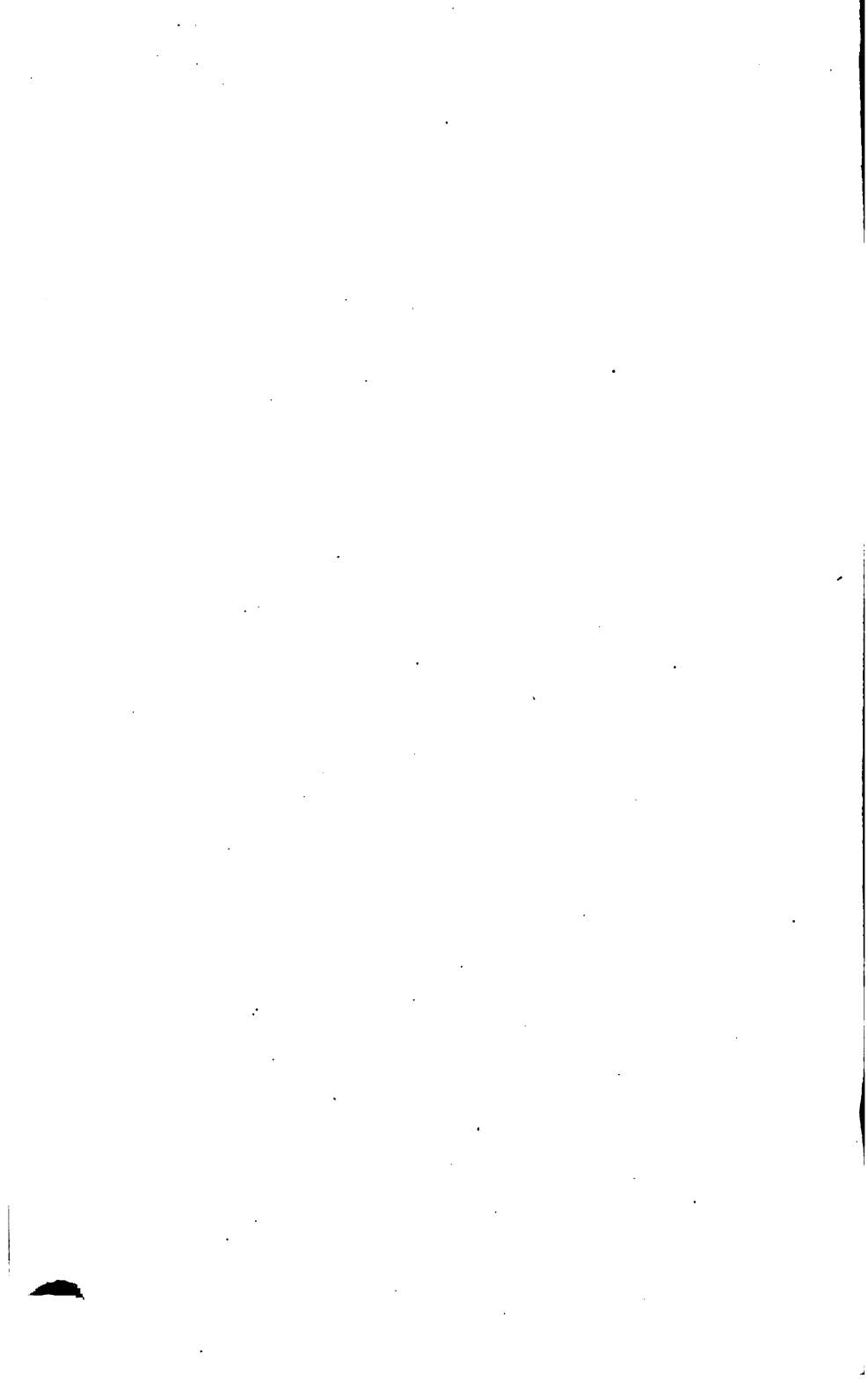


To his Excellency GEORGE STONEMAN, Governor, *and to the honorable the Senate and Assembly of the State of California :*

In accordance with the Act of the Legislature approved March 13, 1883, we, the State Board of Horticulture, respectfully submit our biennial report for the years 1883-1884.

A. H. WEBB, Secretary. By ELLWOOD COOPER, President.

DECEMBER 31, 1884.



CHAPTER LXIII.

An Act to create and establish a State Board of Horticulture, and appropriate money for the expenses thereof.

[Approved March 13, 1883.]

The People of the State of California, represented in Senate and Assembly, do enact as follows :

SECTION 1. There shall be a State Board of Horticulture, consisting of nine members, who shall be appointed by the Governor : two from the State at large, and one from each of the seven horticultural districts, which are hereby constituted as follows :

First—The Sonoma District, which shall include the Counties of Sonoma, Marin, Lake, Mendocino, Humboldt, Del Norte, Trinity, and Siskiyou.

Second—The Napa District, which shall include the Counties of Napa, Solano, and Contra Costa.

Third—The San Francisco District, which shall include the City and County of San Francisco, and the Counties of San Mateo, Alameda, Santa Clara, Santa Cruz, San Benito, and Monterey.

Fourth—The Los Angeles District, which shall include the Counties of Los Angeles, Ventura, Santa Barbara, San Luis Obispo, San Bernardino, and San Diego.

Fifth—The Sacramento District, which shall include the Counties of Sacramento, Yolo, Sutter, Colusa, Butte, Tehama, and Shasta.

Sixth—The San Joaquin District, which shall include the Counties of San Joaquin, Stanislaus, Merced, Fresno, Tulare, and Kern.

Seventh—The El Dorado District, which shall include the Counties of El Dorado, Amador, Calaveras, Tuolumne, Mariposa, Placer, Nevada, Yuba, Sierra, Plumas, Lassen, Modoc, Alpine, Mono, and Inyo.

SEC. 2. The members appointed from each district shall be residents of the district from which they are appointed, and shall be specially qualified by practical experience and study in connection with the industries dependent upon horticulture. They shall each hold office for the term of four years, except that of the nine first appointed, four, to be determined by lot, shall retire at the end of two years, when their successors shall be appointed by the Governor.

SEC. 3. The Board shall appoint and prescribe the duties of a Secretary, who shall not be one of their number, and elect of their own number a Treasurer, both to hold office during the pleasure of the said Board. The Treasurer shall give a bond to the State, with sureties approved by the said Board, in the sum of ten thousand dollars, for the faithful discharge of his duties.

SEC. 4. The Board may receive, manage, use, and hold donations and bequests for promoting the objects of its formation. It shall meet semi-annually, and as much oftener, and at such places, as it may deem expedient, to consult and adopt such measures as may best promote the horticultural industries of the State. It may, but without expense to the State, select and appoint competent and qualified persons to lecture in each of the horticultural districts named in section one of this Act, for the purpose of illustrating practical horticultural topics, and imparting instruction in the methods of culture, pruning, fertilizing, and also in the best methods of treating the diseases of fruit and fruit trees, cleansing orchards, and exterminating insect pests. The office of the Board shall be kept open to the public, subject to the rules of the Board, every day, excepting legal holidays, and shall be in charge of the Secretary during the absence of the Board.

SEC. 5. For the purpose of preventing the spread of contagious disease among fruit and fruit trees, and for the prevention, treatment, cure, and extirpation of fruit pests and the diseases of fruit and fruit trees, and for the disinfection of grafts, scions, orchard debris, empty fruit boxes and packages, and other suspected material or transportable articles, dangerous to orchards, fruit, and fruit trees, said Board shall make regulations for the inspection and disinfection thereof, which said regulations shall be circulated in printed form by the Board among the fruit growers and fruit dealers of the State, shall be published at least twenty days in two daily newspapers of general circulation in the State not of the same city or county, and shall be posted in three conspicuous places in each county in the State, one of which shall be at the County Court House thereof. Such regulations when so posted shall be held to impart notice of their contents to all persons within this State, and shall be binding upon all persons.

SEC. 6. The said Board shall elect of their own number, or appoint from without their number, a competent person especially qualified by practical experience in horticulture, for the duties of his office, who shall be known as Inspector of Fruit Pests (to hold office at the pleasure of the

Board), whose duties it shall be to visit the horticultural districts of the State, to see that all regulations of said Board and provisions of law to prevent the spread of fruit pests and diseases of trees and plants injurious to the horticultural interests of the State, and all regulations of said Board in the nature of quarantining infected or infested districts, and also all rules and regulations of said Board concerning disinfection of fruits, trees, plants, grafts, scions, orchard debris, empty fruit boxes and packages, and other material dangerous to orchards, fruit, and fruit trees are enforced. He shall, also, whenever required, and under the direction of the Board, and may also upon his own motion, and upon the complaint of interested parties, inspect orchards, nurseries, and other places suspected, or believed to be infested with fruit pests, or infected with contagious disease injurious to trees, plants, or fruits, and he shall report the facts to said Board. If, upon report of said inspector, or from well attested facts otherwise before it, said Board shall be of the opinion that any locality, orchard, district, or place is infested with fruit pests, or infected with contagious disease injurious to trees, plants, or fruits, and liable to spread to other localities to the injury of other persons or places, said Board shall by an order entered upon its minutes, so declare said and such infested or infected district or place shall be under the quarantine regulations of said Board. As soon, however, as in the opinion of said Inspector the danger from such locality has ceased, he may suspend said quarantine regulations, and shall immediately report the fact to the Board, who may approve or disapprove his action. He shall from time to time, and whenever required by said Board, report to it such information as he may acquire from observation, experience, and otherwise, as to the best modes of diminishing and eradicating fruit pests and diseases from orchards, and also suggestions in practical horticulture; the adaptation of products to soil, climate, and markets, and such other facts and information as shall be calculated to improve the horticultural interests of the State.

SEC. 7. The said Board, and, in case of necessity, during the recess of the Board, the said Inspector may appoint such quarantine guardians as may be needed to carry out the provisions of this Act, whose duties it shall be to see that the regulations of the Board and the instructions of the Inspector are enforced and carried out; they shall also report to said Inspector, or to the State Board, all infractions or violations of said directions, regulations, and of the law in regard to quarantine disinfection and destruction of pests, and precautions against the spreading pests and diseases. The salary of quarantine guardians shall not exceed two dollars per day, and shall be paid by the owners of orchards and other places and localities under quarantine regulations; and they may maintain an action therefor before any Justice of the Peace in any township in which any quarantined locality is wholly or in part situated. But in no case shall they have any claim upon the State for such services.

SEC. 8. It shall be the duty of the Secretary to attend all meetings of the Board, and to preserve records of its proceedings and correspondence; to collect books, pamphlets, periodicals, and other documents containing valuable information relating to horticulture, and to preserve the same; to collect statistics and other information showing the actual condition and progress of horticulture in this State and elsewhere; to correspond with agriculture and horticulture societies, colleges and schools of agriculture and horticulture, and other persons and bodies, as he may be directed by the Board, and prepare, as required by the Board, reports for publication; he shall also act as assistant to and obey the directions of the Inspector of Fruit Pests in the exercise of the duties of his office, and shall be paid for his services as such Secretary and assistant a salary of not to exceed seventy-five dollars per month.

SEC. 9. The Inspector of Fruit Pests shall receive as compensation for his services not to exceed the sum of one hundred and fifty dollars per month, and his actual traveling expenses shall be allowed, not to exceed seven hundred and fifty dollars per annum; the other members of the said Board shall receive no compensation whatever.

SEC. 10. The Board shall biennially, in the month of January, report to the Legislature a statement of its doings, with a copy of the Treasurer's accounts for the two years preceding the session thereof, and abstracts of the reports of the Inspector of Fruit Pests and Secretary. Said report shall not exceed one hundred printed pages.

SEC. 11. The Treasurer shall receive all moneys belonging to the Board, and pay out the same only for bills approved by it, and shall annually render a detailed account to the Board.

SEC. 12. There is hereby appropriated for the uses of the State Board of Horticulture, as set forth in this Act, out of any moneys in the State Treasury not otherwise appropriated, the sum of five thousand dollars for the year commencing April first, one thousand eight hundred and eighty-three, and five thousand dollars for the year commencing April first, one thousand eight hundred and eighty-four, and the State Controller will draw his warrants upon the State Treasurer in favor of the Treasurer of said Board for the said sums, or any part thereof, when they become available, upon proper demand being made for the same by the said Board.

SEC. 13. This Act shall take effect and be in force from and after its passage, and all Acts or parts of Acts inconsistent or in conflict with the provisions of this Act are hereby repealed.

REPORT OF THE SECRETARY FOR THE YEAR 1883.

To the President and Members of the State Board of Horticulture:

I herewith present to you a brief report of the work of this office up to November first of the current year. The present State Board of Horticulture was created by an Act of the Legislature approved March 13, 1883. It provided, among other things, for the appropriation of \$5,000 for the year commencing April 1, 1883, and \$5,000 for the year commencing April 1, 1884.

It created seven horticultural districts in the State, each entitled to a Commissioner, and two Commissioners from the State at large, all to be filled by executive appointment.

The Governor appointed on that Commission the Hon. A. F. Coroneel, of Los Angeles, and Dr. Edward Kimball, of Alameda County, as Commissioners for the State at large, and General M. G. Vallejo for the Sonoma District, Wm. M. Boggs for the Napa District, Dr. S. F. Chapin for the San Francisco District, Ellwood Cooper for the Los Angeles District, Hon. H. C. Wilson for the Sacramento District, G. N. Milco for the San Joaquin District, and Felix Gillet for the Nevada District.

On the organization of this Board (although a former one, under a previous law, had existed, and which I am pleased to state accomplished great good to the horticultural interests of California), there was actually nothing in the nature of office furniture, nor any books, papers, etc., on the subject of entomology and horticulture, with the exception of the report of the ex-Chief Executive Officer for the year 1882. Of this report, however, there was an abundant supply.

Nor was there to be obtained an idea of the names and address of those who are and have been interested in fruit raising in this State, from any record of such, for the new office. Hence you will perceive how difficult it has been to get the office in an intelligent and successful working order. I take pleasure in informing you, however, that in the short space of seven months I have been enabled to procure the names and address of nearly all those interested in horticulture in California, and as to those who have been omitted, it has been unintentional. For much of this information I am indebted to County Assessors for their kind and willing assistance in furnishing me the names and address of fruit growers of their respective counties, while I regret to say that some few have utterly failed to respond to my request for such information.

Notwithstanding all these difficulties, I have now on my books the names of a great many of the most intelligent and enterprising of California's horticulturists, to whom I have forwarded the late circular of the Inspector of Fruit Pests (which none can fail to appreciate), and nearly three thousand invitations to this Convention, besides hav-

ing written many letters to persons in the East, as well as in the different sections of this State, making and answering inquiries on this most important subject. In all this work I have been greatly assisted by the members and officers of the Board, and in the matter of collecting names to whom valuable information in the form of printed matter is to be forwarded from time to time, I have been materially assisted by our present Inspector of Fruit Pests, who, in his many trips throughout the different sections of the State, in the inspection and investigations of the many important interests assigned to that officer, has kindly and industriously collected a most valuable list for my office.

In this connection it may be proper to state that owing to the provisions of law respecting the mode of drawing funds from the State Treasury for the support of this office, it has been necessary for the Treasurer of the Board, Gen. Vallejo, to make frequent visits to this office on official business, and as the law provides no compensation for that officer, it has been necessarily at his own personal expense. This applies, also, to all the members of the Board (except, the Inspector of Fruit Pests), as the law does not even allow their necessary traveling expenses, some having to travel hundreds of miles to attend the meetings and transact the business of the Board. This difficulty, I doubt not, the next Legislature will take pleasure in remedying with appropriate legislation.

On the fifth day of April last, the first meeting of the Board was held in the parlors of the Capital Hotel, at Sacramento City, at which there were present: Commissioners Vallejo, Chapin, Boggs, Coronel, Wilson, and Gillet, being a quorum. Its organization was perfected by the election of Wm. M. Boggs as President of the Board, and also as Inspector of Fruit Pests; Dr. S. F. Chapin, Vice-President; Gen. M. G. Vallejo, Treasurer, and A. H. Webb, Secretary. Mr. Felix Gillet subsequently resigned the office of Commissioner for the Nevada District, and Mr. N. R. Peck was appointed by the Governor for that district.

At the meeting of the Board, held at their office, No. 40 California Street, San Francisco, April 26, 1883, Mr. Wm. M. Boggs tendered his resignation of the office of Inspector of Fruit Pests, which was accepted, and on motion of Mr. Boggs, Dr. Chapin was unanimously elected to the office.

At the meeting of the Board, July twenty-seventh, President Boggs tendered his resignation as President of the Board, which was accepted, and Mr. Ellwood Cooper was elected President.

At a meeting of the Board on the twenty-fifth of October, a call was issued for the holding of a State Fruit Growers' Convention, to be held under the auspices of the Board, in San Francisco, on the twentieth, twenty-first, and twenty-second of November, 1883, the full report of which will be found herewith.

The following expenditures have been made up to November 1, 1883:

For April and May	\$944 36
For June	328 00
For July	292 50
For August	412 25
For September	275 20
For October	409 50

Total for the seven months of the year\$2,661 81

The expense of furnishing the office with furniture and carpeting amounted to \$362 21. This expenditure in that line will answer for many years to come.

All of which is respectfully submitted.

A. H. WEBB,
Secretary.

REPORT OF THE SECRETARY FOR THE YEAR 1884.

To the President and Members of the State Board of Horticulture:

GENTLEMEN: I have the honor to submit to you herewith this, my second annual report of the proceedings of your honorable body at your several meetings, together with a statement of the receipts and disbursements of this Board; also, a partial statement of the work done in this office since my last annual report, which was up to November 1, 1883, as published, with the proceedings of the Fruit Growers' Convention, held on the twenty-first of November, 1883. At that time a special meeting of the Board was held, and a resolution adopted confirming and ratifying the proceedings of the Board, at their office on the twenty-fifth of October, 1883, which proceedings provided for the holding of said Fruit Growers' Convention. The Board then discussed the propriety of holding fewer meetings, the law making no provision for the payment of their traveling and other expenses.

On motion of Mr. Milco, it was resolved that the future regular meetings of the Board should be held on the last Thursday before the last Friday of April and October in each year, when, there being no further business, the Board adjourned to the twenty-fourth of April, 1884.

OFFICE STATE BOARD OF HORTICULTURE, No. 40 California Street, }
SAN FRANCISCO, April 24, 1884. }

This being the time appointed for a regular meeting of the Board, there were present President Ellwood Cooper, G. N. Milco, Dr. E. Kimball, General M. G. Vallejo, Wm. M. Boggs, and Dr. S. F. Chapin.

At 11:30 A. M. President Cooper took the chair and the Board proceeded to business.

Dr. Kimball called upon Dr. Chapin for his report as Inspector of Fruit Pests. Dr. Chapin stated that he had thought the best time to submit his report would be in the Fall, when he could make one more full and satisfactory than at the present time; though in the meantime he had not been idle. During the past few weeks he had visited Ione and Napa Valleys, and other fruit sections of the State, and had found in some sections fruit trees badly infested with the peach moth. He then exhibited specimens of twigs completely covered with gummy exudations, the result of the work of the larva of this moth. Describing it, he said that the grub bored into the bud, causing the gum to exude, the leaves to fall, and finally the death of the tree. He reported the damage of this insect to be greatly on the increase, and prevalent in Butte, Tehama, and Shasta Counties, as well as in Ione and Napa Valleys. To entomologists this moth is known as *Anarsia Lineatila*, the larva being a grub one half inch long, of a reddish color. The doctor gave as a remedy the following wash, which will exterminate the grub: Whale oil soap and sulphur mixture, three pounds; extract of tobacco, two pints; fluid extract buhach, two ounces; hot water, at 130 degrees, four gallons. These ingredients to be mixed and applied hot with spray.

The matter of assessing fruit trees and vines was then introduced and discussed at length, when Dr. Kimball offered the following resolution, which was unanimously adopted:

Resolved, That the State Board of Horticulture remonstrate and protest against the assessment of all fruit and nut-bearing trees and grapevines, as antagonistic to the development of

the great fruit industry of the State, and at variance with all sound principles of taxation, that assess only the products and not the prospect of annual labor.

And be it further resolved, That the Legislature now in session be requested to adopt such means as will afford relief from the double burden now imposed.

On motion of Commissioner Boggs, Messrs. Kimball, Milco, and Chapin were appointed a committee to confer with a like committee which may be appointed by the State Horticultural Society, and act in conjunction with such committee in presenting to the Legislature these and other resolutions that may be adopted by other organizations.

The Secretary was then called upon for a statement of the financial condition of the Board. He showed that bills had been presented and approved, and the same paid by warrants of the Controller of State on the State Treasury for the year ending April 1, 1884, amounting in the aggregate to \$4,678 30.

President Cooper then offered the following resolution, which was unanimously adopted :

Resolved, That Congress, now in session, be requested to so amend the revenue laws as to require every article imported, whether dutiable or free, intended for human consumption, to contain a true label of its contents, subject to confiscation by default.

President Cooper was requested by the Board to forward to our Senators and Representatives in Congress a copy of these resolutions.

FINANCE.

The financial statement as contained in my last report was up to November 1, 1883, and showed, as the amount drawn from the State Treasury and expended from the appropriation for the year commencing April 1, 1883, the sum of \$2,661 81. Since that date, the following sums have been drawn from the State Treasury on warrants of the Controller of State, and paid out on bills against this Board, as follows:

For month of November, 1883	\$361 40
For month of December, 1883	323 70
For month of January, 1884	422 10
For month of February, 1884	407 29
For month of March, 1884	510 00
For month of April, 1884	454 64
For month of May, 1884	399 80
For month of June, 1884	297 75
For month of July, 1884	291 20
For month of August, 1884	268 75
For month of September, 1884	310 20
For month of October, 1884	499 75
For month of November, 1884	432 70

Total receipts and disbursements since November 1, 1883..... \$4,979 28

Total receipts and disbursements up to November 1, 1884..... \$7,641 09

It would seem useless to allude to our most wonderful and diversified fruit productions, including the orange, lemon, and lime, as well as most of the nut-bearing trees from Shasta to San Diego. Also the extensive olive orchards of Santa Barbara and other sections which equal, if they do not excel, in the quality of the oil produced, that of any other country.

While the acreage of bearing trees is largely in excess of former years, yet from various causes the crop of the past year, of many varieties, was not more than half that of the year before. In this connection it may be proper to state, that the estimate of the fruit crop for the past year, as obtained by the California Fruit Growers Association, and furnished to its members, was found to be remarkably correct, and its members thereby enabled to obtain better prices for their fruit than they otherwise could have done. Since my last published report, the correspondence of this office has been constantly increas-

ing, chiefly among those of our own State, among fruit growers, and those contemplating a change from other pursuits to that of raising fruit trees and vines. Very many new settlers from the East and foreign countries, have, during the past year, found happy homes among us; some have purchased, while others, through valuable aid of the California Immigration Association, have settled on the public lands, and are now planting their own "vines and fig trees." To this most important association, which has done and is doing so much for our State at its own expense, California owes much in gratitude at least. The Secretary, Mr. Street, being always on hand and ever ready and anxious to assist with the most valuable and reliable information concerning public lands.

Great numbers of such persons have visited this office, seeking information relating to this subject. Every effort has been made to supply this constant and growing inquiry, and in this way, vast numbers of our last published reports, besides printed circulars of direction prepared by Dr. S. F. Chapin, the Inspector, relating to remedies for fruit pests, have been distributed.

I have endeavored to open correspondence as far as possible with eastern and foreign institutions and organizations, and persons devoted to, or engaged in horticulture, and while this has in a measure brought about a reciprocal correspondence and exchange of such printed matter as is usual, yet I regret to say that in many cases my letters have not been answered.

Time, however, will, I trust, remedy this, and in another year it is hoped that we may have accomplished more in this direction. The work of gathering the names and addresses of those engaged in horticulture has been no small matter, as my books now contain more than five thousand such persons.

Many thousands of acres have been planted to fruit trees of various kinds during the past year. It is estimated that in the County of Santa Clara alone (which has ever been conspicuous as a fruit section) eleven thousand acres were added to the already extensive and prosperous orchards. In the Counties of Napa and Sonoma fully five hundred thousand French or Petite d'Agen prunes alone were planted; and the unrivaled Vaca Valley, long noted for early and choice fruits, has kept pace with the rest. The fertile and thrifty Suisun also claims attention as containing one orchard alone of some six hundred and thirty acres, which will soon be one of the finest in the world. In the northern portion of the State the desire to plant trees is just beginning to show itself, and it is believed that the coming planting season will show a most wonderful increase in orchard planting. The same and more may be said of Fresno, Tulare, and neighboring counties, while the Counties of Los Angeles, San Bernardino, and San Diego, with a reputation known to all and excelled by none, are all increasing their acreage at a rate unaccountable, and although California is even now far in advance of the Eastern States in horticulture, she is yet in her infancy of greatness as a fruit-producing country.

THE RECIPROCAL TREATIES.

"But while every appearance may seem bright and hopeful for the future, we should not shut our eyes to the threatening and imminent danger of a most unjust foreign competition. I allude, of course, to the so called reciprocal treaties with Mexico and other Central

American republics. It is unjust because it is openly acknowledged by the advocates of reciprocity that the admission of the fruits of those countries free of duty is the chief equivalent offered by the United States for the benefits to be derived by those combined capitalists and corporations engaged in the production and manufacture of coal, iron, steel, and petroleum, and the articles manufactured therefrom. It is gratifying to know, however, that the State Horticultural Society at their last meeting passed unanimously strong resolutions against the treaty with Mexico. But it may not be proper to further discuss this subject in this report. The next and most vital subject that concerns the fruit-grower is the growing necessity for cheaper transportation. This, it is confidently believed, will at no distant day be satisfactorily arranged between the transportation companies and fruit-growers. With this accomplished, and regular daily trains loaded with our choice fruits as fast freight to the eastern markets and the dangers of competition referred to opposed and defeated, we shall be content."

All of which is respectfully submitted.

A. H. WEBB,
Secretary.

TREASURER'S ANNUAL REPORT.

ENDING APRIL 1, 1884.

To the members of the State Board of Horticulture:

GENTLEMEN: In submitting this my first annual report of the financial condition of this Board, it is but just to say that owing to an indefiniteness of the law by which an appropriation was made for the support and maintenance of this Board, I have had much difficulty and annoyance in drawing the funds, and have been subjected personally to the expense and time of making frequent visits to the office which otherwise might have been avoided. And it is to be hoped that the next Legislature will so amend the present law as to remedy these difficulties.

The following claims against this Board have been duly presented, approved, and warrants paid by the State Treasurer, and the same paid by me to the several claimants, vouchers for all of which are now on file, to wit:

For April and May, 1883.

A. H. Webb, salary and expenses as Secretary	\$78 50
A. H. Webb, salary and expenses as Secretary	75 00
William M. Boggs, salary and expenses as Inspector	137 20
S. F. Chapin, salary and expenses as Inspector	62 70
S. F. Chapin, salary and expenses as Inspector	184 15
A. Wason, bill for painting signs	9 00
Butler & Bowman, printing cards	3 00
C. A. Wetmore, bill for table	36 50
William J. Heney & Co., for carpets	123 71
John G. Hodge & Co., bills, stationery	42 60
L. & E. Emanuel, bill for furniture	192 00

\$944 36

For June, 1883.

A. H. Webb, salary and expenses as Secretary	\$96 10
S. F. Chapin, salary and expenses as Inspector	208 30
William McDonald, Janitor	5 00
John G. Hodge & Co., stationery	18 60

\$328 00

For July, 1883.

A. H. Webb, salary and expenses as Secretary	\$76 75
S. F. Chapin, salary and expenses as Inspector	205 75
William J. Heney & Co., for rug	10 00

\$292 50

For August, 1883.

A. H. Webb, salary and expenses as Secretary	\$78 45
S. F. Chapin, salary and expenses as Inspector	156 55
Grangers' Bank, rent of office six months	165 00
William McDonald, Janitor	6 00
A. J. Coghill, bill for stationery	6 25

\$412 25

For September, 1883.

A. H. Webb, salary as Secretary	\$75 00
S. F. Chapin, salary and expenses as Inspector	200 20
	<hr/>
	\$275 20

For October, 1883.

A. H. Webb, salary and expenses as Secretary	\$75 10
S. F. Chapin, salary and expenses as Inspector	262 65
William McDonald, Janitor	6 00
Arthur M. Ebbetts, coal and grate utensils	10 75
Grangers' Bank, office rent	55 00
	<hr/>
	\$409 50

For November, 1883.

A. H. Webb, salary and expenses as Secretary	\$102 60
S. F. Chapin, salary and expenses as Inspector	212 05
Grangers' Bank, rent of office	27 50
Dutton & Partridge, stationery	14 25
William McDonald, Janitor	5 00
	<hr/>
	\$361 40

For December, 1883.

A. H. Webb, salary and expenses as Secretary	\$77 95
S. F. Chapin, salary and expenses as Inspector	203 50
Grangers' Bank, rent of office	27 50
William McDonald, Janitor	5 00
Dutton & Partridge, stationery	9 75
	<hr/>
	\$323 70

For January, 1884.

A. H. Webb, salary and expenses as Secretary	\$112 35
S. F. Chapin, salary and expenses as Inspector	162 75
R. A. Tenney, United States map	3 00
Arthur M. Ebbetts, coal	3 50
Grangers' Bank, rent of office	27 50
H. A. Jones, stenographic reporter	100 00
R. P. Cole & Co., use of chairs	8 00
William McDonald, Janitor	5 00
	<hr/>
	\$422 10

For February, 1884.

A. H. Webb, salary and expenses as Secretary	\$95 50
S. F. Chapin, salary and expenses as Inspector	163 75
Arthur M. Ebbetts, coal	9 00
William McDonald, Janitor	5 00
Dutton & Partridge, stationery	21 49
Wells, Fargo & Co., expressage	112 55
	<hr/>
	\$407 29

For March, 1884.

A. H. Webb, salary and expenses as Secretary	\$83 75
S. F. Chapin, salary and expenses as Inspector	200 50
William McDonald, Janitor	5 00
Dutton & Partridge, stationery	14 75
Wheeler Cannery, glass jars	20 00
M. Morganthouh, glycerine	10 00
Wm. J. Heney & Co., bookcase	105 00
M. Meyerfeld & Co., tobacco	21 50
Grangers' Bank, office rent	22 00
Grangers' Bank, office rent	27 50
	<hr/>
	\$510 00

RECAPITULATION.

For April and May, 1883	\$944 36
For June, 1883	328 00
For July, 1883	292 50
For August, 1883	412 25
For September, 1883	275 20
For October, 1883	409 50
For November, 1883	361 40
For December, 1883	323 70
For January, 1884	422 10
For February, 1884	407 29
For March, 1884	510 00
Total	\$4,686 30
Deduct the bill of R. P. Cole & Co., for use of chairs, which bill had been paid by the State Horticultural Society and the said amount returned to the State Treasurer..	8 00
Which leaves a total of.....	\$4,678 30

All of which is respectfully submitted.

M. G. VALLEJO,
Treasurer.

STATE BOARD OF HORTICULTURE TO THE FRUIT GROWERS OF CALIFORNIA.

Bulletin No. 1.

The Executive Officer of the State Board of Horticulture hereby urgently requests the fruit growers of the State to observe and carefully carry out the following recommendations for the suppression and eradication of the various insect pests infesting fruit trees and fruit:

The means to be used for this purpose are now to be applied for the *Summer* or during the *active* and *fruiting stage* of the tree. Remedies intended for use during the *dormant* period of the tree will at another time be specified.

CODLIN MOTH.

The ground in an orchard should be kept thoroughly clean from weeds by constant cultivation, and the surface in as fine tilth as possible, and smooth, so as to avoid furnishing a hiding place for the larvæ of the moth. The bark of the tree should be as clean and smooth as possible in order to prevent the larvæ from hiding away from reach. All loose pieces of bark should be carefully removed without injury to the green layer and then destroyed and the trunk washed with soft soapsuds or the "whale oil soap and sulphur mixture," in the strength of one pound to one and one half gallons of water. This preparation is a standard one and is most convenient for use. It can be obtained from the manufacturers, Messrs. Allyne & White, 112, 114 Front Street, San Francisco, or it can be bought of, or ordered through, any merchant. Bands should be placed upon trees as follows: Strips of grain sacks or other similar material should be cut about six or eight inches in width and long enough to encircle the trunk of the tree, lapping over slightly, and being folded, placed with the open edge downwards upon the trunk about one foot from the ground; a large headed tack (No. 12, tinned, being the best) will safely and easily confine the band in place. The upper or folded edge of the band should be tight upon the tree while the lower edges should be loose. *Once every week* these bands should be removed and all larvæ found in them killed. *Once every week* all fruit upon the trees should be carefully examined and the infested specimens picked, and then boiled and fed to the hogs; also all fallen fruit should be gathered from the ground *once every week* and be boiled and fed to the hogs. Where instead, it is used for drying purposes, all refuse should be carefully destroyed by boiling and feeding as above. This work should be commenced as soon as the fruit is well set and of sufficient size to examine. Bands should be applied by the middle of May of each year. In addition to the bands, loose rags or pieces of sacking should be placed in the crotches of the trees and scrupulously examined each week. The whole system must be carried out, until

all fruit is finally gathered from the orchard. Fruit at gathering should not be piled up and left in the orchard. Great care should be exercised that no package infested with the eggs, larvæ, or pupæ of any insects be allowed to come upon orchard premises. It is important to see that where goods are purchased through commission houses they be ordered sent direct from place of purchase, as it is known that the eggs and larvæ of insects may be carried with other things than fruit packages. Where *new and free* packages are not used, all packages should be disinfected before being brought into the orchard, either at the distributing centers, or immediately upon their entrance upon the home premises. Even double disinfection would be found to be most profitable. Fruit growers are earnestly requested to examine into the merits of the *free* package system, as it is now believed that the day is near when the *free box* or *package* will be found to be the *cheapest* as well as the *safest* mode of marketing all fruit worthy the growing. The disinfection of packages may be accomplished by dipping and keeping them in boiling water (with or without the addition of an alkali), for the space of three minutes. By the faithful carrying out of these directions it is thought (and as proven by my own experience) that ninety per cent of an apple or pear crop can be saved instead of entailing that percentage of loss, as is frequently and usually the case where the moth is well established.

SCALE INSECTS.

At this season of the year the best remedy known at the present time is that of spraying infested trees and fruit thoroughly with the *whale oil soap and sulphur mixture*, in the strength of one pound to one gallon, or one pound to one and one half gallons water. This may be repeated. In this way the insects may be either entirely destroyed or held in check, and thoroughly treated the coming Winter by other and more suitable remedies for the dormant condition of the tree. (During the *Winter* season the proper treatment is by concentrated lye one pound, to water one and one half gallons, applied by fine spray. *This must not be applied in the Summer time.*) The necessity for careful watching and instant treatment of infested trees is paramount. Regarding the scale *Icerya Purchasi* a special report may ere long be expected.

RED SPIDER.

This pest is best attacked after the egg has hatched and during the period of activity. At this time the whale oil soap and sulphur mixture, in the strength heretofore mentioned, and to which is added a very strong decoction of tobacco, is the most effectual yet used. It is hoped, however, that experiments now in progress with pyrethrum and other insecticides will furnish better and surer means for its extermination.

WOOLLY APHIS.

The positively effectual remedy for Woolly Aphis yet remains undiscovered. Particularly difficult is it to treat the Aphis upon the roots of the tree. The means most effectual for those in the top of the tree is the spraying with a strong and hot decoction of tobacco leaves and stems; one pound to one gallon of water, then diluted by

the addition of another gallon of water when used. It should be applied as nearly as may be at 130° temperature. Applied to the collar of the tree and just under ground, the following has been used with success in destroying the Aphis upon the roots, or at least, in preventing its appearance above ground: Five pounds, or one half gallon whale oil; boil in two and one half gallons water; to this add one third of a pound of potash to make a soap. For use add to this quantity of soap, one gallon of water and one and one half gallons of strong decoction of tobacco. Then to every five gallons of the wash thus made add one half a pint of Calvert's crude carbolic sheep dip. Apply by brush or spray, and then replace the earth mixed with a liberal quantity of air-slaked lime and wood ashes. Investigations to be made this season will doubtless add much to our knowledge of the best remedies for this pest.

GREEN APHIS.

This promises to be troublesome the present season. Until we ascertain better means, the most effectual remedy is the spraying by whale oil soap and sulphur mixture. Other species of the Aphides are noticeable on the apple, pear, plum, etc., and should receive similar treatment.

BORERS.

Preventive measures are far more successful than remedies after the injury has been done. Shading the trunk and preventing the sun burning the bark will almost always prevent the work of borers. This may be done by placing two shakes, one on the south, the other on the west side of the tree; or by means of two pieces of board nailed together and secured to the tree by rope. Also, allow the tree to branch out low down upon the trunk. Where borers have been at work, wrapping the trunk of the tree with burlap has been found to be a most valuable remedy. Rubbing the trunk of the tree near the ground with fresh common bar soap is very useful.

PEAR AND CHERRY SLUG.

The use of dust, or the finely powdered earth of the orchard thrown freely over the tree by shovel or otherwise, is effectual in the destruction of this pest.

TENT CATERPILLAR.

The twigs around which are clustered a band of eggs should be cut off and destroyed during the Winter pruning. When, however, hatched out, the caterpillars should, while in the branches, be taken from the tree in the same way and burned; or when scattered about the tree they should be shaken off, and prevented from ascending the tree trunk by placing upon the trunk a greased band, which they will not cross if the grease is kept soft. They then may be readily killed when collected in masses.

CANKER WORM (ANISOPTERX VERNATA).

For the past three seasons this caterpillar has caused great damage to some orchards, but is not generally known through the State. The

best means of combating it is to place about the trunk of the tree an inch rope, and over this a six-inch strip of tin, long enough to go around the tree and lap over a little, being secured by a nail driven through the tin and rope. The middle of the tin is placed lengthwise against the outside of the rope. This secures a space both above and below the rope between the band of tin and the tree. This proves an obstruction to the ascent of the tree by the wingless moth to deposit her eggs. Apply this band in the Autumn. Destroy bunches of eggs deposited on the trunk below; also, look on the underside of loose pieces of bark for eggs. When the worm is at work upon the tree and the foliage destroyed, there will be no crop of fruit matured. Then the effectual remedy is by spraying the tree with arsenic, one pound to one hundred or one hundred and fifty gallons of water.

Where arsenic has been used, three pounds to two hundred gallons of water, the past season, although burning the foliage at that time, it effectually destroyed the worm. The trees are in fine foliage and bearing a good crop of fruit at the present time.

The *parasitic fungi* (*fusicladium dendriticum*), so designated by Prof. T. J. Burrill, of Illinois, such as is manifest upon blighted and scabby apples and pears; also, the *smut fungus* (*fumago salicina*), observable upon oranges, olives, and the like, infested with scale, may be best treated by spraying trees and fruit with the whale oil soap and sulphur mixture, one pound to one and one half gallons of water.

In order to successfully combat these various pests, the hearty coöperation of all fruit growers is necessary, and it is hoped will be cheerfully rendered. County Horticultural Commissioners are reminded that the law creating those Commissioners is still in force, and that it will be necessary for them to carry on the work diligently the present season. Great caution should be used in sending specimens of insect pests over different parts of the State. Many pests are thus carelessly disseminated through the desire to show specimens. It is advised that no such specimens be sent by mail or otherwise, except to entomologists, or those whose business it is to carry on investigations therewith. When so sent they should be properly secured.

S. F. CHAPIN,
State Inspector of Fruit Pests.

SAN JOSÉ, May 17, 1883.

Bulletin No. 2.

STATE BOARD OF HORTICULTURE,
40 CALIFORNIA STREET, SAN FRANCISCO,
OFFICE INSPECTOR OF FRUIT PESTS, November 5, 1884. }

Careful experimentation carried on for several years (see Report of this office, 1883, page 26, Experiment No. 20), with the more recent addition of two ingredients, has developed an *effectual insecticide* which may be more generally used than any other at this time known, and the cost of which is but one quarter to one third that of the best washes hitherto used. This wash can also be *universally* used, *Summer* and *Winter* alike, for any and all the *insect pests* usually treated by spraying; and with the *very valuable* advantage, so long sought for, without injury to *tree, foliage, or fruit*. It is also of great value in *mildew and fungoid* diseases, such as attack the pear, apple, etc., and to cleanse trees of moss and other parasites.

The most serious of our *scale insects*, the terrible *Icerya Purchasi* (cotton cushion) scale, the San José scale (*Aspidiotus Perniciosus*), and all others of this class are *effectually destroyed* by this wash. For the first named this is the only completely successful remedy that has been used, as it can be applied on *evergreens* as well as to *deciduous* trees and shrubs.

The ingredients used are: Whale oil, concentrated lye (potash and caustic soda), tobacco, sulphur, coal oil, sulphate of iron (copperas).

Difficulty in conveniently compounding the *whale oil soap* makes this portion of the mixture more easily obtained from the Los Angeles Soap Company, who use in 100 lbs of soap, 43 lbs whale or seal oil, 2 lbs tallow or grease, 11 lbs potash, 1 lb caustic soda, 4 lbs tobacco. This portion can be obtained there at a cost of about 5½ cents per pound.

Further steps with ingredients and proportions are given.

(The addition of the coal oil ingredient, and the method of incorporating sulphur, is that used by Mr. B. M. Lelong, San Gabriel.)

The sulphate of iron experiments I have carried on this present season; the formula I have decided upon is as follows, viz.:

Concentrated lye (American) @ \$4 25 per case of 48 lbs; or caustic soda, @ 5 cents per drum—½ lb	\$0 5
Sulphur, by bbl, @ 4½ cents per lb—2 lbs	9
Whale oil soap, Los Angeles Soap Company; per lb, 5½ cents; freight, 1½ cents—8 lbs	56
Coal oil, 2 quarts, 110° test	10
Sulphate of iron (copperas), by bbl, @ 3 cents per lb—2 lbs	6
Water, 32 gallons	
Total	86
Mix.	

Cost, per gallon of mixture, 2½ cents.

This proportion being borne in mind, any desired quantity may be made. Should a stronger wash be desired use but 22 gallons of water.

First put the sulphur in kettle and add a little water, then add the lye and boil together for a few minutes with a *slow* fire, stirring well. *Do not* add any *cold* water when boiling. Now add the whale oil soap

and pour in the coal oil with a little water. Stir well while heating and boiling. After beginning to *boil* add a little *more* water. At all times when water is added do not use a quantity at any one time to exceed the amount of coal oil used. When this is *well cooked*, and the soap is thoroughly incorporated, add the sulphate of iron.

To this whole mixture thus prepared, the full amount of water, *warm* or *cold*, may be added at any time for use.

Caution should be used in mixing the coal oil that the flame of fire does not ignite the mixture, and it is advised that this preparation be carried on in some *safe* place.

It is believed that this mixture, which I will name and hereafter call "Whale Oil and Iron Compound," will give great satisfaction to all who will employ it, and it is therefore fully published.

S. F. CHAPIN.

BIENNIAL REPORT OF THE INSPECTOR OF FRUIT PESTS, S. F. CHAPIN.

To the President and Members of the State Board of Horticulture of California:

GENTLEMEN: In my report to you of the work of this office, comprising two seasons' labor, I can best combine the report of last year, already made to you, and the continued observations of this season, in relation to that previously given. Therefore, in the biennial report of this Board, required by law to be furnished the Legislature at its next session, it is necessary to first place before you that already prepared as an annual report, and, with this additional matter, comprising my official report for the two seasons. For 1883, I have stated, as fully as practicable, the condition of the orchards of the State, particularly referring to the insect pests infesting trees and fruit.

THE PROGRESS OF THE ORCHARDS DURING 1883.

This statement of the work done in visiting the orchards of the State during the season can be but brief. I have endeavored to inspect the condition of the orchards in most of the prominent fruit-growing localities, yet, from lack of time, have not accomplished this purpose fully. I may say that, as a rule, wherever I have been I have found the orchardists making diligent efforts to suppress the various insect pests that have, during the past few years, caused so much annoyance and loss to the fruit interests. Generally speaking, people are alive to the importance of this subject, and I can record but one instance where I have not been courteously received in my official character. Invariably there is a willingness and desire to ascertain the progress made and the most approved methods for the treatment of these pests. Most orchardists are aware of the chief enemies of the fruit growers, and, from the publicity given to the subject, have become, to a great degree, familiar with the damage wrought by them. The different insect pests may be found now spread pretty well over the State, so that it is far easier to enumerate the fruit-growing localities where certain pests do not exist than to name the places where they are to be found. Some of them are found in almost all localities, and certain of them will find a home in one region and be unknown in other parts. One of our greatest obstacles is in the fact that the pests spread gradually, and do not attract attention until a foothold is secured and it is too late to succeed in the effort of *extermination*; consequently *suppression* becomes the only available resource. It may be an impossibility to exterminate certain of our pests, but one notable effort to accomplish this, in the case of codlin moth, will be mentioned further on. If in the case of all this spread of pests it is asked if good is being accomplished, the answer can be made that a great work is being done, and the season has witnessed cheering results.

The *Canker Worm* has, probably, been confined to narrower limits than any other of the various pests. Its damages have been done entirely in a few orchards in Alameda County. In 1881 and 1882 the injury caused by defoliating the trees was very great, and the crop of fruit upon the infested trees was destroyed. Every effort was made in fighting the enemy, and a careful and systematic use of remedies carried on. This year, in a portion of one large orchard, by the previous use of arsenic—three pounds to two hundred gallons of water—the worm was destroyed, and a fine crop of fruit secured—at least one that promised well at the date of my visit. In other orchards the worm has been stayed by various causes, to some extent unknown, but in one case in part attributed to the flooding of the orchard in April, and thus drowning a large number of the pupæ. The owner thinks that had the flooding been done in December it would have killed nearly all the pupæ. Yet, but a couple of miles away, where a badly infested orchard of last year has shown but little damage this season, no flooding had been done.

Caterpillars have caused but little trouble this season where for some years they have been a most serious pest, the efforts made to exterminate them having succeeded admirably. In perhaps the most serious case, where for three years no apples were raised, this year a magnificent crop has been produced. Mr. DeLong, to whom I refer, has been greatly assisted in his work by a parasitic fly. His great care to destroy eggs has, however, brought him through in safety.

The loss by the *Pear and Cherry Slug* has been inconsiderable where it has previously given much trouble. The simple remedy of throwing up and over the tree finely powdered dirt of the orchard has usually succeeded.

The *Pear-Leaf Caterpillar*, which is a small green worm that eats the leaf through and has caused great damage in some orchards, and to be found in many parts of the State, has been most effectually treated in the way of washing at the Oakshade orchard, Davisville. The preparation used is as follows: Tobacco stems and leaves boiled down strong, and the liquor mixed with thirty pounds whale oil soap, ten pounds best sulphur, three pounds concentrated lye, and all this with one hundred gallons hot water. This was, in April, sprayed over the trees three times, and with the best results. The trees were at the time of my visit in July in perfect health, making a most vigorous growth, and loaded with a fine crop of fruit.

The *Saw-fly* of this caterpillar has, in Santa Clara County, appeared in the latter part of July in immense numbers, and in one large orchard of pears a remarkable result was obtained in catching the flies. This was by means of a preparation put out for another and entirely different purpose, viz.: that of sweetened water in cans for catching the codlin moth. My examination of this orchard on July thirtieth, showed in all these hundreds of cans an immense number of these saw-flies, making, together with many large moths, an almost solid mass. Therefore, for this particular purpose, where trouble is caused by this fly, I would recommend the use of these cans partially filled with the above mentioned solution: Molasses, one part; vinegar, two parts; water five parts. To be put out in the trees early in the Spring before the leaves appear. This will, without doubt, prove equally as attractive to the other saw-fly of the pear slug.

The *Borers* have caused some damage in localities, but, as a rule, are easily managed.

The different *Aphides* have been rather more prevalent than usual this year, attacking early in the season the leaves and new growth of different trees, apple and pear trees in San Diego, the plum in Fresno and Hanford, the cherry in Grangeville, and the peach in many localities. It has disappeared as suddenly as it came, however. A species affecting the California black walnut, at Haywards, is more lasting in its effects, being so serious as to, in reality, spoil this beautiful tree for shade. This trouble has been observed in no other locality.

The *Woolly Aphis* has this season in many localities been worse than usual, and in other places, not the ordinary trouble has been experienced. Reports of great trouble have come from some counties, making orchardists feel that unless a remedy should be found it would result in being, as one in Butte County expresses it, "at this rate, simply a matter of time when our apple orchards will be ruined." Many of the oldest apple orchards in the State are so badly infested that it would be really the best to dig the trees out and burn them. In some young orchards, vigorous and healthy heretofore and well cared for, this pest has made great strides this season. One writes as follows from Bakersfield:

I find the Woolly Aphis making fearful ravages in some orchards. One, in particular, I want to call attention to of about five or six acres in a high state of cultivation and beautiful trees. I examined thoroughly a year ago, could detect no trouble; repeatedly since been through the orchard, and always kept an eye to insects, and never detected anything. Roots, limbs, and body seemed to be smooth, clean, and free of knots. A few days ago the owner sent for me to come and look at it, and I found the aphid had full possession. Seemed to start in one corner and go diagonally through from southeast to northwest with the wind; the further from the corner the lighter. It is a pitiful sight. Every knot, crevice, and crack is white and many bunches on the limbs higher up. The orchard is eight years old. No other orchard but my own within four miles of it, and both these healthy, apparently, and it until two weeks ago. Is it possible it could have been lurking in some tree overlooked, and made these strides in so short a time? Might an old box that had contained apples impregnated that corner? What is best to do, and have the trees if possible?

Well might this County Commissioner speak of the ravages of this insect, and ask these questions. There have many remedies been suggested, some succeed at times, and fail at other times. Probably as good a remedy as can be used is that of caustic soda in strong solution, about one pound to one gallon of water, applied to the collar of the tree, and large roots near the earth having been pulled away for the purpose. Mr. Cooper has used this wash successfully. During my visit to his orchard I could discover no trace of the insect. During a recent visit to Santa Cruz, on the premises of Mr. Pilkington, an old orchard was inspected, the work done in which would encourage the advocates of allowing hogs to run at will in the orchard. In this case a few trees were fenced off with some vines so as to allow hogs to run in the main orchard. Previous to this all the trees have been badly and equally infested with this pest. This season, however, the trees where the hogs have run have shown no aphid, while those kept from the hogs have been and are now infested. The hogs have rooted at will; and have uncovered the large roots near the trees, and, it is evident, have done much to lessen the evil. The result in this case would seem to prove that but one species infest both roots and top. Lime placed in excavated spots about the tree, and allowed to come in direct contact with the infested roots, is

recommended. Mr. Cooke has seen the best results from this in some cases. Also the same with wood ashes and tobacco leaves and stems is to be advised.

It is likely we will never be freed from this pest until we can secure some resistant stock upon which to work the apple. It is extremely rare that this insect attacks the pear, but I have in a few instances noted it. It is well here to call attention to the necessity of thorough cultivation, and to the use of fertilizers to keep the trees in as good health as possible. General Vallejo calls particular attention to the use of well rotted manure, and states that before the American occupation of California there existed very fine peaches. They were all seedlings. It became the practice to use fresh cow manure about them, and the result was disastrous, favoring the introduction of diseases, and so soon destroying the trees. He lays special stress upon the use of only well rotted manure.

The *Red Spider* has given some trouble during the season, but not so much as in some previous years. I have found it in almost every fruit-growing locality. Among the remedies employed this season I have made numerous experiments with whale oil soap and sulphur mixture, with strong alcoholic fluid extract of tobacco, prepared at Louisville, Ky., with fluid extract of pyrethrum (buhach), and other materials, such as soda ash, etc., and these in different combinations and various degrees of strength. Of these various preparations the following may be used: whale oil soap and sulphur mixture, three pounds; fluid extract tobacco, two pints; fluid extract buhach, two ounces; hot water, four and one half gallons, mixing and using hot. This may be applied now and again in the Spring. Mr. D. D. Hudson, manager of the Fresno Vineyard Company, told me that on this place last year the red spider was very bad. His treatment was by washing in the Autumn, while the foliage was still on, with concentrated lye one pound to four gallons of water. This did not seem to harm the trees at all and has resulted in cleaning the trees from the pest, as no spider can be found upon them this season. Another species of mite (yellow) has been troublesome in some localities, attacking trees in Summer, usually in August, and spinning a web, curls up leaves and causes great damage. It fortunately does not last long in the season. Messrs. Lewis, of Fresno, and Thomas, of Visalia, told me that they had successfully combated them by spraying with cold water simply.

The *Diabrotica*s, particularly the *Twelve Spotted*, does considerable harm, eating leaves and tender wood, and commencing on the nearly ripe fruit eats into it and spoils it. The apricot suffers more damage than any other fruit. It not only does this work on deciduous fruits, but, as Dr. Hays, of San Luis Obispo, writes, it causes much harm by eating the green shoots of the orange trees. A mixture of air-slaked lime and ashes thrown over the trees is offensive to this beetle, as is also smoking or smudges. A good method is that of using manure for material for burning under the trees where the *diabrotica* is feeding and upon this putting a mixture of one pound of sulphur and one ounce of powdered buhach. A preparation of buhach has been used in Sacramento, as mentioned in Mr. Cooke's book, composed of six pounds of buhach steeped in one gallon of alcohol, then diluted with twenty gallons of water and spraying it upon the trees. This, it is stated, destroyed the pests very effectually.

Grasshoppers have this season done much harm in a few localities

defoliating trees and vines. One gentleman writes, July second, from Easton, near Fresno: "My orchard skirts my alfalfa fields. When the alfalfa is mown the grasshoppers, which are very numerous in the alfalfa, take to the trees, not only eating the fruit, but stripping the trees of all leaves, and eating into the bark." Another gentleman writes from Pasadena, July ninth: "The grasshoppers have destroyed the foliage on about five hundred of my trees, and all my vines, two thousand." They made their appearance with so little warning that he was taken unprepared. He further says, "that the grasshoppers show a preference for apples, pears, and lemons. As yet apricots are little touched, and peaches half defoliated." In such cases it would be well to try the remedy under the head of diabroticas.

Rabbits and squirrels eating trees; not all our pests are confined to insects. I receive letters of complaint concerning the damage wrought upon young trees by these nuisances, and one legal gentleman writes asking information as to remedies, and closes with the question: "Will we never have an enforceable squirrel law?" Allied to these are the underground enemies, particularly gophers, which cause an immense deal of damage.

The *White Ant*, another serious underground enemy, has done great mischief in a few cases. I have received information that an orchard at Mountain View has been very seriously troubled, and at this time many trees have been lost. The pest attacks the tree just underground, and girdles it completely. The best remedy is the application of pure whale oil soap about the collar of the tree.

The *Curculio* has not reached this State. Thomas Meehan says: "They seem to be marching westward, however. On some wild plum bushes, along the streams, near Mandan, Dakota, all the fruit had been attacked by the insect."

The different *Fungi* cause much trouble in localities. In some places the apricot is so badly damaged by a fungoid growth upon the fruit as to be worthless. This exists in many counties, and specimens have been sent me that were completely ruined by this growth, and so not even good for drying. The pears, in some localities, so suffer from arrested development and disorganization of the tissue of the fruit as to make it impossible to grow them. This is the case about Watsonville, in the Pajaro Valley, where for several years no trees of some varieties have matured perfect fruit. In many parts of the State there may be found some of this, but not usually so as to ruin the fruit. In some cases this work has been thought to be the work of insects, *Haltica Chalybea*, but it is purely a change of tissue. In the East, in some localities, growers of pears have secured a smooth and healthy surface to the pear, of certain varieties usually badly affected, by heavy watering. They do this by digging holes large enough to contain several gallons of water at a proper distance from the tree. It is notable here that the worst cases of pear disease occur where they do not irrigate. Usually in irrigated regions the pear does well in this State. This Autumn I have found at Montecito, Santa Barbara County, and at Haywards, one orchard in each place, a fungus upon the leaves growing upon the underside of the French prune and some plums. This I have not noticed before in the State. Specimens sent to Dr. H. W. Harkness, so well known as an investigator of the different fungi, were pronounced by him to be the early stage of *Uromyces Prunorum*. He had first found it in an orchard in Yolo six years ago.

Mildew is common and frequently causes much damage. Of late a solution of carbonate of soda, two kilogrammes in a hectolitre of water, which is about four pounds to twenty-six gallons, has been found to be very useful sprayed upon affected vines. It would be well to try this upon the mildew of our trees.

Peach Tree Blight.—I have received numerous letters from different portions of the State concerning a blight upon the peach trees. This trouble exists upon the Santa Cruz Mountains, in Yuba County, upon the Sacramento River, in Ione Valley and vicinity, and perhaps other places. It has become to peach growers in those regions a somewhat serious matter. Mr. A. Loomis, President of the Santa Cruz Mountains Fruit Growers' Association writes:

In some localities here the peach trees especially are badly affected with what they call "gum blight," and in some instances the trees are dead or nearly so. It commenced with the young wood and that which was the least matured and gradually transmitted to the whole tree. The branches are covered with particles of gum. The trees seem to be affected most in the coldest spots and where they are most exposed to cold currents of air. My opinion is that it is caused by sudden changes of the weather after sap commenced to flow.

Last Winter he says was the coldest for some years, and four years ago, after a very cold Winter, the peach trees were some of them affected in the same way. The effects were similar in other cases. At Ione some were disposed to attribute the trouble to the work of insects. At the time of this trouble I had no opportunity to personally observe these trees.

A peculiar apple tree blight has attacked trees in certain portions of the San Joaquin Valley. At Fresno in the Central California Colony, at Visalia, and at Grangeville this disease was noted. It affects the limbs of the trees, denuding them of all foliage in the smaller branches, and then causing death. Some apple trees also show a gumming and gluing of the bark and death in spots.

The Peach Moth (Anarsia Lineatella).—This moth has for two seasons caused considerable loss to peach growers in a few localities, while in others it has done but little damage. It has been supposed that it had existed in the State but three years; but I was informed by a prominent fruit grower at Vacaville that he had observed it in his orchard for twenty years, causing but slight damage. At the Natoma orchards, Folsom, the insect was observed this season and its habits noted. Mr. W. H. Tucker writes as follows concerning it, July 16, 1883:

Observations on a new pest appearing on plums, peaches, apricots, and nectarines: A worm, sharp at both ends, varying from one quarter to three quarters of an inch long, unusually active, alternate brown and white rings, and not known in the State annals or records of fruit pests. First noticed on peach trees, on the buds near the ends of tender shoots; bored down the pith for three or four inches until near older wood, then came through and out, and disappeared. Nothing seen of them again until apricots ripened, when discovered on the fruit, going in from the stem and boring into the pit when it split, and when not split going around, boring out to surface and disappearing. In July were noticed boring into peaches, apricots, nectarines, and all varieties of plums, boring into side or end indiscriminately, ruining it, and coming out to surface to disappear, and apparently being greatly satisfied when they could find a pit split, taking up their quarters for a longer time therein. Apparently short-lived, and reproducing itself several times during the season. July twenty-fifth: We have found them hibernating under the rough ends of bark of trees, generally high up, and never (so far) low down, which would indicate that they *crawl down* the branches of trees, unlike the codlin moth, which drops down and crawls up to hibernate. We have also found it hibernating in a split pit of peach, and even in the meat of the peach, when it had left the stone and was making for the outside of fruit, and turned to chrysalis before reaching the rind. It has also been found (under glass) to come out of the fruit a lively worm and within twenty-four hours enter chrysalis state on the side of the glass cover. We have observed it to hatch out after

eight days into a living moth of dark iron gray, a little smaller than the codlin moth, say one half to five eighths of an inch long, and much larger on the first day than the cocoon. We have not yet noticed the length of time between the broods, but have noted that this (July 25, 1883) is the third brood of the season.

During my visit there, I ascertained that this insect had caused a loss of ten per cent of early peaches, Hale's early and Alexander, and five per cent of apricots and nectarines. The late peaches were not troubled; the moths not having been seen since August first. The larvæ go into pupæ in fruit or any hiding place on the tree. They were found under bands and above and below them. Where five bands had been placed on one tree they were found in all of them. So far as can be judged now the best treatment would be the full pruning in the Winter, and the Summer pruning or pinching off through the season, and burning the portions removed.

The *Codlin Moth*.—The ravages of this insect have been noticed in almost every fruit-growing district in the State, the extensive losses from which you have often considered. The spread of this pest from its first introduction to the State at Sacramento, nearly ten years since, has been steady and rapid, until now it is known by its work to almost every person who uses the fruit it infests. The important consideration now before us is the most effectual means of ridding ourselves of its presence. These various remedies are now pretty well understood. The one about to be adopted at San Diego would be the sovereign cure could it be unitedly and universally agreed upon. However, that would seem quite difficult of accomplishment. I refer here to the stamping out or starving out process by the destruction of the fruit upon which the larvæ feeds early in the season. At a very interesting meeting which I attended at San Diego, on October twentieth, this course was resolved upon in the infested districts of that enterprising county. Can they carry this resolution through they will have done what no other community ever accomplished in that particular, and we should give them, by our hearty approval, the encouragement they need. As this moth is the special enemy of the apple, pear, and quince, it is extremely rare that it attacks other fruits. So rare is this the case that in my own experience, after a careful accounting of more than thirty thousand larvæ, during two seasons, in but three instances was this larvæ found in other fruits, viz.: in one apricot and two peaches. Such percentage is extremely small.

Regarding the means of suppression I can offer encouragement from the observations of another season. Where the really vigorous and systematic effort has been made good results have been attained. It should, however, be noted, that those who are not willing to make an enterprising and constant warfare upon this insect, should not engage in the culture of apples and pears. A few instances of quite effectual work upon a large scale may be mentioned to buoy up our hopes and keep our interest from flagging. One very important fact observed this season is that the greater part of the loss has occurred during September. It should cause us to use every effort to destroy the earlier broods. In the largest apple orchard of California the work done this season has resulted in saving the larger portion of an immense crop of fruit. The great moth trap, where many thousands of moths (not larvæ) had been caught and killed up to the time of my visit, July twenty-eighth, has prevented damages to a high degree.

Mr. DeLong will no doubt give statements of his work. In the Oak-shade orchard, before mentioned, the wash used for the destruction of the green pear caterpillar had apparently from its early and frequent application prevented the moth from laying its eggs upon the fruit. Mr. Treat writes that he has but very few of the codlin moth this season. This spraying, it will be remembered, was done early in April and thrice done; again, the vigilance exercised and the careful work done in the Natoma orchard has been most encouraging. Where the crop of thirty acres of Bartlett and Winter Nelis pears had previously been almost entirely lost, this season the loss has been reduced to a very small per cent. Here the different means advised in the circular to fruit growers had been carried out. In January the trees had been washed with caustic soda, one pound to two and one half gallons of water, to a depth of six inches under ground, where upon the trunk of the tree large numbers of larvæ were found. Also, when the fruit had reached the size of marbles another washing was given, using whale oil soap, twenty pounds; sulphur, six pounds; concentrated lye, two pounds; water, forty gallons. The infested fruit was carefully picked from the trees, the bands were scrupulously attended to, all fruit gathered from the ground, and the whole work done in such manner as to tell in the grand result. The work carried on in one of our oldest and largest apple and pear orchards of Santa Clara County merits attention from its results. I referred to this orchard in my report last season. The same plan has been carried out this year and the owner tells me that he has been quite successful. At various times while visiting there I have watched the work with great interest. In this case the loss has been in total about twenty per cent; on apples, chiefly the late varieties, twenty-five per cent, but with pears only five per cent. He has also used cans with sweetened water, as before alluded to in this paper, in which he caught some codlin moths, but the cans were chiefly filled with other moths and flies. I would by all means advise the use of this as well as the other different means used, but I would caution fruit growers to be careful how they make that their *only* dependence. I have observed its use in many orchards this season and have made careful examinations in all such cases to ascertain what proportion of moths were codlin. I have found in but very few instances any codlin moths. Sometimes one or two moths of that species were found. The greatest number found in one can was *three* and that but once. In an extensive apple orchard in Sonoma County, well known to you all, I found that all these various means of suppression, including the cans, had been carried on, and the crop, though a light one, a most healthy one.

There have been noticed in a few localities some insect enemies of the codlin moth. Mr. DeLong has noticed these, as he yesterday informed me. I have also learned from my children that they have found a considerable number of the same larval enemy occupying the cocoons of the codlin larvæ in which no pupa case was found. These larvæ, in size, were very much like the codlin larvæ, but had many legs, and were brownish on the back. Dependence on the work of these parasites and enemies, should not, however, take the place of other efforts by the orchardists. In my orchard the work done this season has been carried out with the same care and particularity that I reported so fully at the last convention. The peculiar-

ities of the visitation of the codlin larvæ can best be shown by tabular presentation.

Eight hundred and fifty trees, bands applied May 12, 1883:

EXAMINED.	Larvæ in Bands.
May 19.....	0
May 26.....	8
May 31.....	8
June 9.....	2
June 20.....	65
June 27.....	159
July 6.....	555
July 13.....	523
July 23.....	547
July 31.....	463
August 6.....	248
August 13.....	230
August 20.....	241
August 28.....	426
September 6.....	1,117
September 15.....	1,073
September 22.....	1,657
September 29.....	2,262
October 6.....	170
October 13.....	76
October 20.....	21
November 3.....	0
Bands removed.....	3
	9,852

Infested fruit picked from trees, estimated up to August 28, 4,150; infested fruit gathered from ground, estimated to time of harvest in September, 2,500; infested fruit at harvest, 20,000; cost of picking infested fruit and examination of bands, \$41.

As accurately as can be figured, the loss upon the entire crop is nineteen (19) per cent, and of this, as per tables, three fourths occurred during September. A question is here presented. Out of twenty-six thousand, in round numbers, infested apples, ten thousand larvæ were caught in the bands; where were the balance? The larger number were in the infested fruit when gathered from the trees and taken up from the ground and then destroyed. Yet it would still leave some unaccounted for, and these must have gone into the ground chiefly, as will be seen from further statements, and some of them upon the trunk of the tree beneath the surface. These observations have been made during the season; through the entire season the infested fruit picked from the outside row, and at each end of the orchard contiguous to this row, has been more than double that found in any other portion of the orchard. This has been the case, also, with the larvæ found in the bands. At harvesting, this same fact was shown. This great difference is accounted for in this way: on my northeast corner, though some distance away, is a very badly infested and uncared for orchard, and also on my southeast one, which previously had not troubled me, but this year supplied great numbers of moths. These old trees, I am happy to say, are now being dug out, as they are worthless. In one instance this season I found in one apple, at the same time, four larvæ of different sizes. This is the only case I know of where so many have infested one apple. As showing the efficacy and great value of the burlap bands, of the large number caught during the entire season, but five

larvæ were found in cocoon *above* the bands, also one crawling worm and two empty pupa cases. A considerable number were found *below* the bands and also upon the trunk under ground, but they were chiefly in and under the band itself. From the results obtained by this cheap and simple material, it is difficult to conceive that woolen cloths or other expensive materials could be more effectual. October sixth and thirteenth—After harvesting, the two hundred and forty-six larvæ found were almost wholly on the trees under which the apples in boxes were temporarily placed while picking, although speedily removed from the orchard. This shows how useless it is to remove bands before or even at the time of harvesting, unless the apples are *immediately* carried away from the vicinity of the trees. The bands were kept on until no more larvæ crawled. Then they were removed and burned. I shall this Winter carefully remove the earth sufficiently to wash the trunks of trees a few inches below the surface.

In the Press and Horticulturist an article from Mr. Gillet alluded to a supposed expression of mine that the cold weather of Winter would destroy the codlin moth. I have no recollection of ever having used such expressions, as I never have held such views. The only possible statements that could be so construed might have reference to the fact that the severe weather had affected the fruit crops so as to lessen the chances for the full propagation of the moth.

SCALE INSECTS.

With most of these I will ask you to spend but little time.

The *Black Scale* is to be found more particularly all along the coast of California, wherever there are citrus fruits or olives. It as well attacks deciduous trees, more particularly the apricot in the southern coast counties. It does not flourish upon orange trees in the interior hot counties. Few can be found in San Bernardino County. It is usually so bad upon olive trees, through the south, that but two orchards that I know of, along the coast, have been so thoroughly and so successfully treated as to produce profitable crops of olives. One, the largest and best known in the United States, the owner, Mr. Ellwood Cooper, has rendered very productive and valuable. I wish also to mention the very valuable work done with this pest by Major Levi Chase in his orchard at Cajon Valley, San Diego County. The remedies used by these gentlemen, and first recommended by Mr. Cooper, were strong and hot solutions of tobacco. Mr. Cooper now uses a very cheap compound of caustic soda, grease, and tobacco that is worth giving in full: Place a lump of caustic soda the size of one's head in an iron kettle, the largest size used on a No. 9 cooking stove, then pour upon that the strongest decoction of tobacco (already prepared), adding gradually until the soda is dissolved, and the kettle nearly full, then add grease (mutton or beef tallow, or any refuse grease), as much as will be taken up by the tobacco and soda. For use take two or three gallons of this strong solution and add two hundred gallons of previously prepared hot tobacco solution. The whole is then ready to spray upon the trees, used at a temperature of 130°. This is effectual in destroying the scale, and is good for the tree, leaving it clean and bright. To the strong solution should be

added gradually the large amount of tobacco decoction until it has the right life and foamy appearance needed.

- The *Red Orange Scale* (*Aspid Aurantii*) remains in Los Angeles County, doing its work with but little change from year to year. It is a most serious pest where it exists.

- I have received specimens of the *Aspidiotus Nerii*, a scale infesting the oleander and some other ornamental as well as a few deciduous fruit trees. The bottle in which the specimens are contains a very large number of the very minute winged males just hatched out at this date, November seventeenth; also, there may be seen a few young females crawling about. This time of the appearance of the young males in large numbers proves that there are three broods of this scale in the season.

- The *Aspidiotus Rapax* is to be found all through the State, particularly the coast counties, but apparently does little harm, although in some places it infests the fruit of the pear to an offensive degree. This scale has been without doubt brought from abroad as a new importation of it was made last Spring upon apples from New Zealand.

- The *Aspid Conchiformis* or *Oyster Shell Bark Louse* has kept on its steady way through the apple orchards of the State, and owing to the fact that it usually has caused but slight harm has not been much troubled by the orchardist, although occasionally one is forced to heed its presence. One notable example is that in an orchard at Santa Cruz where the pest appeared in slight numbers in 1881. The next year the scale increased so rapidly that it did very serious harm and nearly killed a considerable number of trees. Some varieties, Bellflowers particularly, suffered more than others. In this case the remedy used was the concentrated lye, one pound to one and one half gallons of water, with good effect. The larger portion of the scale have been destroyed and a good crop of apples secured this year.

- The *Aspidiotus Perniciosus* or *San José Scale*.—The work done in destroying this scale has been most gratifying. In my report of last year I gave as fully as possible the information possessed at that time. The condition of the infested orchards has become as a rule most satisfactory, and now again large profits are accruing to those formerly discouraged orchardists who have faithfully combated the scale. In Santa Clara County, the home of this scale, we may say, the day has been won by the fruit grower, and where three years since orchard land was at a very low figure it has doubled and more than doubled in value, and really fine orchards are hard to purchase at any price. This is the direct result of the success attained fighting this scale on the part of the large number of enterprising horticulturists of this valley. The increase this year in the County of Santa Clara of \$3,500,000 in assessed property is attributable in a large degree to intelligent horticulture, and it is to be hoped that the powers that be will act upon an appreciation of this matter and aid in every way in their power in preserving and fostering this industry. The value of the fruit crop of this county for last year as returned by the Assessor was \$1,611,800, a gain over the previous year's report of more than \$600,000. This includes all kinds of fruits. For the State the fruit crop is the fourth in value, and it was estimated would reach \$10,000,000 this year. It is probable it has exceeded that.

As an illustration of the effectual work done here (and many large and important orchards might be referred to), I will mention but one. This orchard, one of the oldest in Santa Clara Valley, of nearly

one hundred acres, has been infested by this scale seriously. It existed in the orchard for three years, commencing in 1880. It was brought in on young trees. It has been fought very vigorously and effectually. The orchard this season practically cleansed of its presence. At this time the owner finds the scale upon one young Easter Beurre pear tree. The wash used for cleaning the orchard was: Concentrated lye, one pound to one gallon water, where there was scale, and one pound to three gallons water where not infested. The Bartlett pear yielded to the treatment more readily than others. These required but one washing, while the Easter Beurre required five washings. It is now proven positively that birds are the means of carrying this scale from infested orchards to distant ones where clean trees intervene. This, aside from the sure means of introduction by nursery trees and infested boxes, and clothing, is, I believe, the only way in which the scale is carried about.

The *Perniciosus Scale* has now spread over large portions of the State, both north and south. Wherever it appears, it is urged again, that it be most vigorously treated without delay, else the orchard is destroyed. All young trees sent out for the new planting should be sent clean, and thus be safe to the trusting orchardist. The remedy now universally used is: Concentrated lye, one pound to one gallon water for *Winter*, and whale oil soap and sulphur mixture, one pound to one gallon water for *Summer*.

The *Icerya Parchasi*.—This scale merits now special attention, and from the serious nature of its ravages, and the difficulty of overcoming it, should receive your most earnest consideration. Last year, in a report upon scale insects, I referred to this insect, describing it, and naming many varieties of ornamental trees, shrubs, and plants it attacked. This year I have often spoken of it in my visits through the State, and particularly have I tried to awaken citrus fruit growers to the danger awaiting them where this pest gets thoroughly established. It is there that its greatest mischief is accomplished. While in the northern part of the State the ornamental trees may suffer, the real loss of a living for the orchardist does not occur; but where this once gets a foothold in an orange grove upon which the owner is dependent for an income, he will indeed be fortunate if he succeeds in stamping it out of existence. In all my statements of the ravages of this insect at San José, I have never stated that it attacked the orchards of Santa Clara Valley. I have simply named the apple and pear trees in the cemetery of that locality as showing its presence. I would not have stated that the orchards of this prosperous valley suffer from the attacks of this pest. I most emphatically pronounce the orchards of Santa Clara Valley free from the presence of this *Icerya* scale, and I do but justice when I declare that there is not a *deciduous* orchard in the State that is infested with it, merely saving a few isolated *deciduous* trees in one of the infested orange orchards of Santa Barbara County.

A mistaken impression may have arisen from my remarks about this insect. The development of the pest, as studied for several years, now show that the great work is done upon evergreen and ornamental trees and shrubs. And although where deciduous trees are immediately in contact with the other infested trees they will also become liable to their attacks, yet this insect has not as yet done any damage to an orchard of deciduous fruits in this State. The damage it has done to ornamental trees and shrubs is very great; it has caused a

serious loss in that respect, and its spread continues. Without any desire to alarm unnecessarily, or to detract from the good report of any interest, I must, as a matter of plain duty, lift up my voice and warn particularly the growers of *citrus* fruits lest they too late appreciate most bitterly the importance of this matter. I will quote from a high authority, Mr. Ellwood Cooper, who says, in a letter to me: "I, however, repeat what I have told you before, and what I have written you, words fail to express the danger of the spread of this pest. The citrus interest does not comprehend the danger in waiting." This is the expression of a careful observer, and one who has most deeply at heart the welfare of horticulture in this State. I have recently returned from a visit to the infested localities, and I can but confirm the statement of the desolating results attending the presence of this insect. I am glad to say that the most vigorous efforts are being made to clear the infested orange orchards of two of the regions affected. The localities where it is found in the north, are San Rafael, San Mateo, and San José; in the south, Santa Barbara, Los Angeles, and San Gabriel. I have been informed by Hon. A. F. Coronel, of our Board, who is in attendance upon the sessions of the Convention, that he has recently found at least three new orchards at Los Angeles infested with this scale. At least they were orchards of which I could obtain no information at the time of my visit. You will learn from Mr. S. P. Stow of his efforts in this direction, using steam as a means of applying remedies.

It was my privilege to meet with fruit growers of San Gabriel and consult with them concerning measures to destroy this enemy already lodged in six of their valuable orange orchards, and from the earnest and decisive proceedings at that time, I knew they would soon provide the means to buy, dig up, and utterly destroy the infested trees. This fund has already become sufficient for the purpose, and it is their firm intention to accomplish the work of eradicating this pest. All honor to the example thus set. The same honor must be accorded to the people of Riverside for their successful efforts in preventing the red orange scale from gaining entrance to their fairy land. As has before been mentioned, San Diego has taken up the same course in dealing with the codlin moth. Could the whole State show this determination, the losses from insect pests would be reduced to a minimum. Last year I gave no statement of the results of treatment, and I will now make to you a report upon experiments made with the *Icerya Purchasi*. I will premise by saying that the difficulties detailed would not be experienced in the case of *deciduous* trees, for our well known remedies for other scale insects would suffice. These experiments have been made and watched for two seasons. You will see mostly failures, and for that reason I wish to state them particularly; but there is also success attained. All experiments were on very badly infested trees and shrubs:

No. 1. Tobacco, strong decoction, one hundred and thirty degrees.

December 6, 1882—Applied upon an apple and a pear tree, both small, and in a nursery bed where there were ornamental plants.

December 23, 1882—Examined trees. The scale was not killed. Wash did no injury to trees.

No. 2. Concentrated lye, one pound; water, two and one half gallons; boiled and stirred whale oil, one third gallon; then add considerable sulphur.

December 6, 1882—Washed one California laurel, one rose, one bridal wreath; used cold.

December 23, 1882—Examined. It had killed the scale wherever it had come in contact with them. Did not injure the thick-leaved evergreen California laurel, but does destroy the foliage of the bridal wreath and rose.

No. 3. Whale oil soap and sulphur mixture, one pound to one gallon of water, and used at more than one hundred and thirty degrees.

December 23, 1882—Washed a large bridal wreath and a large rose.

January 9, 1883—Examined about one hundred different insects of all sizes and at all stages of development; also, many young that had just hatched out, and still with the eggs adhering to the mother insects—could find motion in but one insect, which was unharmed. All others were softened and had a putty-like consistence, and were dead—the color somewhat changed, though not very much so. The eggs did not seem to be affected in the sac; bushes and foliage unharmed. (Note—At the time a little stronger wash will probably be best.)

August 25, 1883—Found on the wreath but seven live scales, and on the rose but four. No old scale to be found; both bushes healthy. New growth of wreath, two feet; of rose, three feet.

No. 4. Whale oil soap, ten pounds; kerosene, one gallon; water, forty gallons.

December 6, 1882—Washed one bridal wreath, one rose, one large acacia tree, taking a section of the trunk.

January 9, 1883—Insects alive and unharmed; foliage not affected in any case.

August 25, 1883—Found that these had all been killed by the insect, and the immense acacia had been cut down.

No. 5. Paris green, one tablespoonful; water, one gallon.

December 6, 1882—Washed a bridal wreath, a rose, and limb of acacia tree.

January 9, 1883—Insects alive—young and old entirely unharmed. Bushes unharmed.

No. 6. Bitter aloes, ten ounces; water, one gallon.

December 6, 1882—Washed a locust and two bridal wreaths.

January 9, 1883—Insects unharmed, and still at that time hatching out.

No. 7. Sal soda, one pound; turpentine, one pint; water, ten gallons.

December 6, 1882—Washed rose and wreath.

January 9, 1883—Entirely ineffectual.

No. 8. Lime water, saturated solution.

December 6, 1882—Washed a climbing vine.

January 9, 1883—Insects and vine unharmed.

August 25, 1883—The vine is nearly dead, and a fir tree in the same lot in the cemetery is dying, being covered with the *leerya*.

No. 9. Pyroligneous acid, four fluid ounces; water, one gallon.

December 6, 1882—Washed one rose and an acacia.

January 9, 1883—Insects unharmed; old and young active and crawling around; foliage not affected.

August 25, 1883—Rose dead; killed by scale.

No. 10. Pyroligneous acid, two ounces; water, one gallon.

December 6, 1882—Washed a pittisporum tobira and a rose in bloom.

January 9, 1883—Neither shrub nor insect affected.

August 25, 1883—The pittisporum found a mass of scale and dead.

No. 11. Pyroligneous acid (Phil.), one gallon; water, one gallon.

December 23, 1882—Washed a bridal wreath.

January 9, 1883—Not killed.

August 25, 1883—Scale found alive on these shrubs.

No. 12. Pyroligneous acid (Cal.), one gallon; water, one gallon.

December 23, 1882—Washed wreath and rose bushes.

January 9, 1883—Scale not killed; bushes unharmed.

August 25, 1883—Live scale on both the wreath and rose.

No. 13. Pyroligneous acid (Cal.), in varied strength, upon oleander, rose, and wreath, resulted as above.

No. 14. Kerosene butter, one pint; water, one gallon.

December 23, 1882—Washed bridal wreath and rose bushes.

January 9, 1883—Not killed; neither insect nor shrub appear to be harmed.

No. 15. Spirits turpentine emulsion. The emulsion made of soap bark, and containing thirty-three per cent of turpentine.

December 8, 1882—This strength was applied on dwarf box, saturating the shrub and also the ground at its roots.

December 11, 1882—Does not kill the scale, and does no harm to the shrub.

No. 16. The above emulsion, one pint to one gallon water, applied to small apple tree in nursery bed, and also poured on ground at roots.

December 11, 1882—Found of no effect.

No. 17. Concentrated lye, one pound; water, two and one half gallons; boiled and added whale oil, one third gallon; used cold.

December 8, 1882—Washed pittisporum tobira and bridal wreath.

December 11, 1882—Scale all destroyed, and the plants nearly so—too strong.

No. 18. December 8, 1882—The preceding applied to an American elm tree, twenty feet high, over a considerable portion of its surface.

November 17, 1883—This tree has been examined a number of times during the Summer. It has grown well, but has had some scale upon it all the season.

No. 19. Concentrated lye, one pound; water, two and one half gallons; whale oil, one third gallon; sulphur added as much as will be readily taken up; tobacco decoction, very strong, six pints.

December 8, 1882—This wash was applied at 130° to an American elm tree, twelve years old, twenty-five feet high, covering almost the whole of the tree.

November 17, 1883—This tree, examined at various times through the Summer, has shown a vigorous growth and a healthy condition, and has been exceptionally free from the scale. At no time could I find many scale upon it, and careful examination at this date shows not more than a couple of dozen. I should judge this tree is practically clean.

No. 20. Concentrated lye, one pound; water, two and a half gallons; whale oil, one third of a gallon; sulphur, all that can be taken up; tobacco decoction very strong, six pints.

December 8, 1882—This, at a temperature of 150° in the kettle, was applied upon an English laurel.

December 10 and 17, 1882, and January 7 and 8, 1883—Examined very carefully and could not find any live scale. They were all destroyed from the day of application, and were quite dried up. The foliage, being of very thick leaves, has not been harmed.

May 26, 1883—My notes show that the tree has made a vigorous growth of new wood. No scale can be found upon it. The old dried up shells of those killed have nearly all fallen off. The same condition has been noted at various dates, and no scale could at any time be found.

November 17, 1883—To-day one small scale, just commencing the growth of the white portion, was found upon the trunk of this laurel; this insect coming from other infested plants near by. This case shows a complete success. The remedy was entirely effectual. This wash is right for so thick a leaf as this evergreen possesses, but is too strong for the thin leaves of the bridal wreath and rose. I would suggest its use as an effectual remedy with a little larger quantity of the tobacco decoction, making the whole five gallons. This wash used hot I regard as the most valuable one of all the list, and with the strength as above given will probably be safe upon thick-leaved evergreens, but should not be used upon those thin and tender leaves spoken of. In the latter case, No. 3 (whale oil soap and sulphur mixture), *hot*, is to be recommended.

No. 21. Whale oil soap and sulphur mixture, one pound to one gallon water, with the addition of kerosene butter, one pint, was applied December 23, 1882, upon rose bushes and bridal wreath, used warm.

January 9, 1883—Scale not killed. In this case the wash was not as hot as in No. 3, although thought to be 130°, but was carried some distance before being applied.

No. 22. Pyrethrum, one ounce to ten gallons water.

November 16, 1882—This was applied by Mr. Milco to ten different trees, shrubs, and plants.

November 25, 1882—The examination showed that the plants were not successfully cleaned of scale.

No. 23. Pyrethrum, one half ounce to one gallon water.

December 23, 1882—Washed rose bush.

January 9, 1883—Found bush still infested.

August 25, 1883—The scale had killed the bush.

No. 24. Pyrethrum, one ounce to one gallon water.

December 23, 1882—Washed bridal wreath.

January 9, 1883—Scale still on bush.

August 25, 1883—Bush nearly dead and covered with scale.

No. 25. Pyrethrum, two ounces to one gallon water.

December 23, 1882—Washed rose bushes and bridal wreath.

January 9, 1883—Insects were not destroyed.

August 25, 1883—Bushes were covered with scale and dead.

These experiments with pyrethrum were made as carefully as possible, but the preparations were not strong enough for this extraordinary pest. It might require the full strength of the fluid extract of the buhach to accomplish the work. While this agent may not be so readily used upon the stubborn scale insects, yet its effects are most

wonderful upon certain of the insects which so greatly annoy us. It is invaluable for the destruction of many insects, particularly of the household.

Having in this report brought before you as clearly as I could the condition of the orchards of the State for the year 1883, I have only taken up certain important matters. I greatly desire to dwell upon other and also very important subjects to the orchardist. Time will not allow even an allusion to these themes.

As a summing up of the work accomplished by the fruit growers of the State thus far in the year, it may truly be said that only encouragement is visible to those who are in earnest about the great horticultural work of this favored State.

Peach Moth (Anarsia Lineatella).—The Spring of 1884 has witnessed the development of one of the worst pests known to peach growers. Making its appearance as the first pest of the season, it attracted much attention. In fact, it had heretofore infested but few localities comparatively, and from its sudden accession in point of injury has caused widespread alarm. This pest has been treated of in the previous report known as the Peach Moth (*Anarsia Lineatella*). Upon its first appearance this Spring, I started out upon my visits to infected orchards. Among the first to show its presence the orchards of Ione Valley were inspected. These were found to be suffering terribly. The work of the larva of this moth can be readily detected after having witnessed the effects of its visitation. There are two principal periods of invasion by distinct broods, one of which attacks the young and tender shoots immediately upon the first growth, the other and later broods attacking the fruit. The leaf or wood buds, after having grown an inch or so, is attacked, and the larva during its period of development feeds upon the pith of the shoot. It first perforates to the center, and then eats its way gradually down the pith, leaving a round bore for about an inch, when, having reached maturity, it leaves the cavity by again perforating the side. Its further progress is similar to that of the codlin moth larva; it seeks a hiding place and spinning a cocoon, consisting of but a few threads, it passes the period of transformation to the moth.

From this time to the Summer invasion of the fruit is a period where the work of the insect is obscure. However, when the fruit which it prefers begins to ripen, the larva of this moth is found at work, and the peach is riddled by it, as is the apple by the codlin larva. It is possible that this insect is to play a more important part in hindering the fruit interests of this State than even the codlin moth. Its power to destroy the tree is a most serious consideration. After, as above described, the larva has perforated the new growth, the twig quickly wilts and droops so peculiarly that the cause is readily recognized. It then turns brown and dries up. Soon the exudation of gum covers it over and gives to the whole twig an appearance as if shel-lacked. It is obvious that when a large number of larvæ are at work the severe denudation of foliage causes the tree to either die, or become worthless for the season, by reason of the destruction of these twigs. Later on in the season, if the tree do not die, a new and second growth of wood takes the place in part of that which has been destroyed. This, however, does not repair the injury done, for the tree will be found bare of all small limbs and twigs in the lower part and in the main body, and only having the new growth at the ends of long limbs, which should ordinarily be pruned away the following

Winter. This, as described, is the ordinary result following the attack upon thrifty *old* trees. Where the trees are very *young*, that is planted but one or two years, and the larvæ not very abundant, the wood which has been destroyed is quickly replaced by a subsequent growth so complete as to secure the tree from essential damage. In the case of old trees the top should be heavily pruned after the larvæ have abandoned the tree, so as to favor the production of an abundant new growth of twigs throughout the tree. At the time the larvæ are at work all infested twigs should be cut away from the tree and burned. This at the present time seems to be the main relief at hand towards control of the pest.

As soon as the trees begin the coming Spring to put forth new growth this pest will be at work over a large part of the State, and attention should be given it immediately upon its appearance. Spraying the trees with the wash advised in Bulletin No. 2 (just issued and distributed) just at the time of first growth of new season's wood, may be useful in checking the ravages of this insect. The extent of territory over which this moth has already spread is very great. I have carefully noted its presence in the various localities, and regret to say it can be found in a very considerable portion of the northern and central regions of the State. I have not found it any farther south than the orchards of Fresno. It is likely, however, to spread in that direction the coming season, and will probably be found in the southern counties before long. It seemed that this season it first attracted attention, as before mentioned, at Ione, and in the vicinity. I followed it north, and found it in almost every locality visited through the various counties up to Shasta, where it caused great damage. In the vicinity of the coast, it was found in Napa Valley, but not in other of the regions bordering the Bay of San Francisco. In the mountain fruit localities, noted for the finest of peaches, it has caused very serious losses this season, destroying the crop almost entirely in many places, and ruining the trees. So far it has seemed to affect the trees of the hotter localities more than those of the cooler climates.

As illustrations of the injury this moth is capable of producing, I may mention a few orchards in different localities. At Ione Mr. H. Dutschke has five hundred peach trees eight years of age, and for the period of six years the total yield in that time has been ten sacks of dried peaches. This orchard has been well cared for during all this time, being pruned and well cultivated every year. But this moth has been at work for most of the time here sufficiently to cause this great loss. This gentleman did not discover the cause of the trouble until recently, although knowing that something was at work destroying the buds of his trees. In this particular vicinity, and on the Mokelumne River, this work has been going on for several years, but not until of late has the true cause of mischief been understood. In the northern portion of the Sacramento Valley, in Shasta County, in one of the orchards bordering the Sacramento River, three hundred peach trees were destroyed by this pest in a short time this Spring. The insect caused no serious trouble last year, and a very profitable crop was raised, as had been for years previously. The owner did not know the cause of the ruin until it had been accomplished. Also in the very finest and most profitable orchards of the Sierra foothills the ravages of this insect are most serious, the result being the same in all cases where the larvæ have been present in sufficient

numbers. It is to be hoped that it may be controlled or to a great degree suppressed in the future.

Codlin Moth.—This pest has gained a foothold on this coast, without doubt, it will maintain. It has been found that wherever had once appeared it has never been exterminated. There is but one way in which *extermination* could be accomplished, and that way practicable, could every fruit grower agree to the plan and faithfully carry out the proposition. This is by the destruction for a season all the fruit that the codlin moth feeds upon, the picking of the fruit being done as soon as set and then destroyed.

I am aware that this plan would never meet with the assent of fruit growers, and, consequently, could not be carried out, or, at least not until a more enlarged idea of what is involved shall become prevalent. Until that time, extermination being practically impossible, suppression of the pest is our only means of relief. We must do what we can, and accept the result with what grace we can command. In several years the spread of the codlin moth has engaged the attention of fruit growers, and many of them have made the most persistent efforts for its destruction. Some few have very carefully noted the results of their labors in the most practical manner, and it is safe to say that never before have so large sources of information regarding its habits and destructive work become available. This, together with the most complete experimentation as to the best methods of suppression, gives us the best known means of combating this destructive pest, capable of causing the loss of hundreds of thousands yearly to the coast. So far there has not been developed any more effectual methods of warfare than those heretofore described and dwelt upon, viz., the use of the *bands* about the trees, the *careful picking* of all infested fruit from the trees, and the constant gathering up of *all windfall*. To make these means moderately successful, care must be taken to examine the bands *weekly*, so as to destroy all larvae hidden away there, and also to perform the other work *carefully* and *thoroughly*. The report of last year and at previous times tables have been prepared showing percentages of loss from this pest, as well as other figures pertaining to it. This season has been in most respects similar to those detailed.

There has been a gradual spread of the pest through and into regions hitherto free, and now this moth may be found in almost all apple and pear-growing localities in the State. The statement of the damage it has caused would be almost incredible could it be given. It is to be noted that this season has in the *foothill* regions produced fruit more free from codlin moth than for some previous years. This has been owing to the fact that last year the crop of fruit was almost destroyed by the Spring frosts, and thus starved out to great extent the moth. Had the advice tendered at that time to the fruit growers of such regions been followed, and *all the remaining fruit* been destroyed, they might reasonably have expected a thorough destruction of this moth for those localities.

Among the mechanical appliances from which good results are to be expected is the *codlin moth trap*, invented by Mr. G. W. Thies of Winters. Enough has been learned of its usefulness the present season to recommend the careful trial of it by all orchardists. Unfortunately too many fruit growers are indifferent to the present and spread of this pest, and depend upon finding sale for their fruit diseased as well as sound. To show the fallacy of such dependence

the time has already arrived when infested fruit, and also dragging along with it the choicest sound fruit, has been rejected in one of the most important markets hitherto open to the apple growers of this coast. The customs authorities of New Zealand have condemned and ordered the destruction of cargoes of apples shipped from our port to theirs. This was carried out or attempted in part in the case of the shipment sent by the Royal Mail steamship Zealandia, reaching Auckland November first. In this case, however, the plan pursued by the authorities was a most unfortunate one, for from accounts it appears the fruit was taken about to various localities from where it was dumped, and the spread of moth is sure to be favored in as full a degree as though no action had been taken. Their action, however, is warning to fruit growers that that market is closed to any but shipments of strictly healthy fruits.

A year since at San Diego great interest was taken by fruit growers in an effort to stamp out the codlin moth by the method proposed above. I think, however, that no active measures to that end have yet been made. It is to be hoped that in such isolated localities some thorough trial of this plan can be made. There is, however, too often a yielding to apparent fate, and, as the task seems too great, neglect follows, and consequent loss instead of gain results.

Two species of scale insects here follow as of greatest importance to the orchardist. To the deciduous fruit grower the *San José Scale* (*Aspidiotus Perniciosus*) is of greatest moment, while the other referred to, the *Icerya Purchasi*, claims the most anxious attention of the citriculturist. First, I will consider the work of the *San José Scale* for the past season. In the locality where this pest first appeared several years since, and where so serious damage followed its advent, there has been a most gratifying decrease, not alone in its numbers, but in the destructive effects following its presence. Both these results have naturally come from the intelligent and well directed efforts made by determined men to overcome this agent of mischief, and they have succeeded so well that where the proper watchfulness exists, and the proper attention is given to infested trees when found, this pest is kept at bay and overcome. The work accomplished in this respect has vastly increased the value of the orchards of the Santa Clara Valley, as well as the unimproved land, and has resulted in doubling the assessed value of property in that county within a few years, it now reaching \$35,000,000. It is not too much to say for horticulture and viticulture, that these pursuits have been the chief means of this great increase of values. What has been said for one county may be said of a great portion of the State.

It is to be regretted in regard to the *San José scale* that in many districts where this scale has made its appearance orchardists have not more carefully heeded the warnings often repeated, and watched for its first appearing, when it could readily be stamped out. From the experience and knowledge gained, the statement can be made without reserve, that taken in its inception this pest *can be exterminated*. Ample evidence of this fact can be seen at any time in orchards at San José. While this scale may be found in many different localities in the State, it, however, has not as yet caused any great decrease in orchard products. The warning must be again given, that this pest *must* be watched and destroyed before it causes this immense loss which ignorance and neglect will surely invite. To those who have not carefully followed the literature of this subject

for several years past, it is advised that they procure the various reports and discussions in print, where quite complete information may be acquired.

Icerya Purchasi Scale.—In the southern counties of the State the most serious pest claiming attention at present is the *white scale* (*Icerya Purchasi*). The important place this pest is to occupy in regard to the welfare of Southern California cannot be overestimated. Whether the people will or no, this scale, if allowed its own unmolested way, *must* cause them ere long to regard its presence, and *then* their wonder will be that they could so long remain indifferent to its ravages, and until it had caused the loss of untold thousands to them. For *surely* this scale will create consternation to all affected by its ravages, and the loss will fall not alone upon the *orange growers*, but upon every *business man* and *resident* of large communities. Not only this, but irreparable loss will be sustained in the *depreciation* of land values that are now not even thought of except by the few farseeing ones who already have knowledge of the power of this insect for harm. Not only have I for several years often spoken and written upon this matter, but numerous others, fully appreciating the importance of this subject, have, over and over again, warned the people against allowing this scale to spread. This is the more applicable to the southern counties because this scale *prefers* the *varieties* of *trees* upon which the prosperity of those counties depends. From the rapid increase of this white scale in the localities where it may be found in the south, it is only a question of *time* when it will have destroyed absolutely the citrus enterprise. At present this scale in that portion of the State is to be found in a limited portion of Santa Barbara County, and in two portions of Los Angeles County, viz.: Los Angeles City and suburbs and San Gabriel. In the northern portion of the State it has attacked only evergreen and ornamental trees and shrubs, and for this reason does not harm the *pecuniary* interests of the *north*, as it does of the *south*. It in the northern portion of the State has been confined principally to one city, San José, and its cemetery, and to the towns of Santa Clara and San Mateo, south of the Bay of San Francisco, while north of the bay it has existed for some years in the town of San Rafael.

Let no one think that in thus carefully specifying the locations of this pest that there has been any intention or desire to prejudice the interests of any, but purely the earnest hope that attention being attracted, the work of controlling this insect may be heartily entered into.

At this moment of writing there comes to me a communication from Los Angeles, reading as follows: "What will it cost the nurserymen of Los Angeles to have you come and inspect our nurseries. Our nurseries are absolutely free of *White Scale* or other insect pests. But your report in reference to White Scale in certain localities in Los Angeles has been published in the papers far and wide, and it has done us an incalculable injury, and we are very anxious for you to inspect closely our nurseries and orchards and give us justice," signed by one of the prominent nurserymen of Southern California. Here I will, before answering individually, distinctly aver that I regret exceedingly that any report of mine should work harm to any one's interests, but I feel that I could not perform my bounden *duty* should I fail to call attention to these injurious pests, and by such means secure a thousand from harm where one would be in any way

injured. Let me point out the fact that far more injury is always sure to result to a community exposed to the ravages of diseases or pests, if an effort be made to *conceal* the evil, than would arise if the danger be promptly recognized and measures taken to abate the affliction.

I may mention here the prompt recognition of the orchardists of San Gabriel of this scale, and the active measures taken by them to destroy this enemy. The work done is most commendable, and is working out its reward. More than a year since I had the opportunity of meeting with the citizens of San Gabriel, to consider the presence of this scale in a few of their orange groves, and to devise means of extermination. The earnestness of their counsel at that time augured success, and the most vigorous efforts have since been made in carrying out the work. Practically, the details of treatment have accorded with the successful experiments reported from this office a year since and made two years ago. A most energetic corps of officers of the San Gabriel Fruit Growers Association was appointed, and the work superintended by Mr. B. M. Lelong, whose method has been to proceed with his assistants through the orchards, completely equipped with spraying apparatus and material, and after a careful inspection of every tree, in order whenever an infested tree was found to at once thoroughly wash that tree and pass on. In this systematic way, out of nearly one hundred thousand citrus trees in this district, seventy-four thousand five hundred were examined, and out of that number six hundred and forty-seven found infested and treated at a cost of \$1,200 for the entire work. These statements were made to me at the time of my second visit to that place, May nineteenth this year, and this work inspected by myself. The infested trees were found in fourteen orchards. The expenses were met by an assessment upon all citrus trees in the district, the owners almost unanimously agreeing thereto. Mr. Lelong, in addition to the ingredients mentioned in experiment No. 20 of the report to this Board last year, and which has been most judiciously compounded by the Los Angeles Soap Company in most convenient form for easy application, has used a small amount of *coal oil*, about three per cent. These various ingredients, properly compounded and judiciously employed in the washing of the trees, has resulted in no injury to trees or fruit, but on the contrary has cleaned them of the pest—in most instances no signs of any remaining, while in some instances the trees must be again washed. There is yet much more to be done, and the same gentleman is in charge and most vigorously engaged. I expect a thorough demonstration will there be made of the possibility of ridding a neighborhood of this terrible pest.

At my last visit to San Gabriel, November of this year, I had the satisfaction of finding trees that one year ago I saw covered with this white scale *now* entirely free from it and in a most healthy condition of growth and fruitfulness. And this I saw in numerous orchards. I cannot forbear in this connection to call attention to the necessity for *united action* in the treatment of this trouble. It is *absolutely necessary* that this work should be done with the full concurrence of all interested, and that it be done at one time as nearly as may be in any one infested district. The reasons for this are apparent. The easy spread of this insect by crawling from tree to tree, and by being carried from place to place on the feet and feathers of flying birds, makes it possible to readily undo the most careful efforts if carried on only

in a partial and spasmodic way. It was noted at San Gabriel in reference to this scale that it spreads in the direction of the trade winds, from southwest to northeast. At every place, outside of the one from which it first started, there the scale was found thickest in trees that contained *birds nests*; and in nearly every instance in all these orchards, where the trees were worst infested, there were found nests, and in these trees, moreover, immediately around the nests the insects were most abundant.

These facts are well worth noting, as they explain the peculiar appearance of the pest in most unexpected localities. It also shows the necessity for close examination of orchards supposed to be entirely free from scale. The amount of wash used on these infested orange trees averaged, for the whole number of six hundred and forty-seven trees, one hundred gallons for twenty-six trees ten years old when properly thinned, and if not thinned then fourteen trees were washed with this quantity. Three men were sufficient to do this work. The pump preferred has been a "Hooker Excelsior No. 1." It is double acting. With this is used one half inch four-ply hose. The spraying is done with the San José nozzle. This pump is most useful for large work—where a small amount of work is to be done the "Climax spray pump" is to be preferred. During this season I have seen a newly introduced pump called the "Novelty," which would seem to be most admirably adapted to this work. I, however, have not yet tested its merits, but am advised that it is a very valuable pump. The cost of the two latter, is fifteen dollars each. The great value of the Climax pump lies in the fact of its having *metal valves*, and from that reason being free from the corrosive action of the various washes used.

Much more might be said in regard to this scale and its destructive effects, but enough has been brought before the public to render it hopeful for the most earnest efforts towards its suppression. In previous reports from this office, the insect has been carefully described, its history and habits given, and its ravages detailed, together with the many experiments made to find effectual remedies. As has before been stated, but *one* of all the number of some forty different preparations experimented with proved entirely successful. That was an *effectual* wash, and with some slight changes in proportions, and with two additions, that of coal oil in small quantity, as used at San Gabriel, and the other of sulphate of iron (copperas), with which I have made numerous experiments this past season, has produced the most effectual and most convenient combination at this time known for this purpose. This combination, as I have from the experiments made this season, deemed the most advisable one, I have furnished in bulletin form to the public with full particulars of preparation. I have named this preparation "whale oil and iron compound," in order that it may have a distinctive appellation. This is published in full on page 22 of this report as *Bulletin No. 2*. Frequent reference to this will hereafter be made as a wash *more universally* applicable than any other to the different insect pests, and to the fact that it may be used at *all times* of the year.

In regard to the other species of scale insects infesting deciduous trees and fruits but little need be said now. There has been this season but little change in their work from that of previous years and heretofore described. The scales affecting the citrus trees and fruits offer no particularly new points for consideration. The *Red Scale*,

well known in some portions of Southern California, has not spread this season to an appreciable extent; but it is, however, a serious matter to the localities infested. In one infested orchard at Orange I found at the time of my visit, November twenty-third, a great part of the infested trees had been destroyed and subsequently removed.

The *Black Scale* is the most universal scale, and has been known by all citrus fruit and olive growers of the State who have trees within reach of certain influences from coast climate and winds. These limits do not extend by *miles* from the coast, but by these peculiar influences referred to. It has now been fully established that this *Black Scale* (*Coccus Oleo*) will only thrive under certain favoring influences, and that remote from these in the hotter and drier interior climates it will die out even after being introduced on living transplanted trees.

To illustrate this fact, trees infested with this scale have been taken to the interior hot valleys, and have been, after a season, found to be free of scale. I have found this to be the case at Riverside, and other portions of San Bernardino County. During a late visit to Ontario, this fact was brought strikingly to my notice by Mr. Chaffey, who showed me orange trees planted this last Spring, and upon which a few black scale remained, and by their side trees planted a year previous to these, and which, although at time of planting were infested, had now become clean; also, at *Pomona*, one of the choicest spots in the State for citrus fruits, Mr. Frank House, in kindly showing me the orchards of that favored locality, proudly called attention to the fact that no pest existed there upon their citrus trees or fruits. It is at this place, a few miles from its western boundary, that this exemption from the presence of the black scale begins, and nowhere east of that boundary can this scale thrive. It is here that the olive first shows the beautifully bright and clean appearance so characteristic of that tree in its perfect health. This exemption results in the greatest fruitfulness, as I saw demonstrated by the inspection of trees at *Pomona*, Ontario, and Riverside.

To those who have their grounds infested by this scale, it is apparent that the trees must be freed from it as far as possible if they would meet with greatest success. To the orange tree, as regards fruitfulness, freedom is not so absolutely essential as to the olive. This tree cannot be fruitful while infested seriously. The few gentlemen—notably among them should be mentioned Mr. Ellwood Cooper, Major Levi Chase, and some others—who have made diligent and successful efforts to subdue this scale, can plainly see that upon this effort depends the profit derived from the culture of the olive. In some localities the black scale has seriously infested deciduous fruit trees, and these should be cleaned, for with the means now at hand there is no excuse for allowing this pest to remain. The wash above referred to will quickly destroy the scale.

In noting the presence and effects of the *Woolly Aphis*, it has been observed that no particular increase or decrease of this pest has taken place, and it does not seem that the peculiarities of the season in any way affect it—about the same amount is observable in the apple orchards of the State, in some very bad, in some very little to be found. On the whole, however, there has been less apparent than in previous years. Probably the best remedy for this pest is found in caustic soda, a strong solution—one pound to one gallon of water is applied

to the collar and large roots of the tree after removing the earth immediately about the trunk of the tree.

Caterpillars have this season in some localities caused more harm, and in other places previously infested less harm than in seasons before. Several species have been at work. The *Red-humped* caterpillar has been received from various localities, and although it has not caused a great deal of harm to orchardists it should be destroyed wherever found.

The *Pear Saw-fly* caterpillar has caused great damage in some orchards of Vaca Valley, or more particularly Pleasant Valley. In one orchard visited by me May 3, 1884, eight hundred Bartlett pear trees were completely defoliated by this little green caterpillar, which at that time had just reached their maturity. A most valuable use of the Thissell trap was here apparent, where it had been placed in a *reversed* position about a few trees it acted as a perfect protection in preventing ascent of the tree by the worms after being jarred from the leaves. Where this pest exists in great numbers the crop of fruit is destroyed. The application of a wash by spraying over the worms when young and partly grown is effectual, but after the worm has reached maturity the spraying is of little effect.

The whale oil soap with sulphur was used by Mr. Frank Buck with great success on these caterpillars while in the early stage referred to. For this pest may be recommended the wash—Bulletin No. 2. Also, as the best preventive against the ascent of the tree by dislodged caterpillars, the Thissell trap should be employed.

The large caterpillars, which have for some seasons caused so great damage in the orchards of Marin County, have this season been observed by Mr. F. C. DeLong to be infrequent, and no damage has been caused by them.

The *canker worm* has also been confined within its original limits, and has caused far less injury than in the two or three previous years. The mainly effectual remedy has been the preparations of *arsenic*, as has been described in previous reports. Also, of great efficiency has been the efforts made to trap the wingless female moth during her Winter ascent of the tree to deposit eggs. In this case also could a most effectual use be made of the *reversed* Thissell trap.

The different species of *cut-worm* have this season done far greater injury than before. Probably, where they have been carefully destroyed this past Spring they will not be abundant in future. The season for some cause developed an unusual number. They not only infested vineyards, but orchards as well.

The proper method of treatment is to work the ground carefully about the trunk of tree or vine, and pick them up and destroy them.

Thus far has been detailed the principal insects that have caused harm to the orchardists this season.

Of the *Fungi*, which have been prevalent, that affecting the *pear* has been far wider spread and more injurious than heretofore. The best treatment for this is probably that in which *copperas* (sulphate of iron) enters as a component part. The experiments made this season lead me to think that the "whale oil and iron compound" will be best adapted to the treatment of this and other fungi.

In one mountain region of the State (the Santa Cruz) a most serious blight to the apple has given trouble. It has been confined to a few varieties more particularly, the *White Winter Pearmain* being most seriously affected. This affection is well described by the Los Gatos

Mail: "The fruit and foliage of many of the apple trees growing on the Santa Cruz Mountains are seriously affected by a fungus growth. The leaves turn brown, as if scorched by a fire, sometimes in spots, and then altogether. Whole branches on a tree are affected, while other parts remain untouched. In the same way the fruit is variously affected, some apples escaping entirely, while others are nearly worthless, though the fungus growth on the fruit of an affected tree is more general than on the leaves. The affection on the apple commences with a small white scale. As the disease spreads, the fungus takes on a dark color, the white scale still marking the outer edges. When of the size of a pea, it shows plainly to the naked eye the characteristics and ramifications of a fungoid growth. The skin of the apple near the fungoid spot presents the shrunken appearance of burnt leather. When, as in some instances, a dozen of these fungoid spots locate on an apple, the growth is nearly arrested. In bad cases the apple may be nearly covered with it, not getting a quarter of the usual size." There is no doubt that the peculiarly wet season was promotive of these fungoid growths, for at least they are more prevalent in such seasons than during the drier years. For this, the wash previously mentioned should be tried. The *shot-hole* fungus has been prevalent over many portions of the State, and in some localities has caused great injury, while in most places it has not resulted so disastrously. It attacks several varieties of trees, perforating the leaves so seriously in some cases as to leave but little remaining beside the ribs. It also attacks the fruit, and sometimes renders it unsalable, if not by defoliating the tree even rendering it unproductive.

In connection with this subject, it is proper to call the attention of the Board and the public to the eminent services being rendered the State by the studies and original investigations of Dr. H. W. Harkness on Fungi.

This State has been free from the *Plum Curculio*, and although it had been feared by some that it might be present here, I am happy to say that it cannot be found on this coast.

We have also hitherto been measurably free from the ravages of grasshoppers and like pests. I will, however, call attention to a singular circumstance which I observed in Tulare County on November thirteenth last. In the vicinity of the sink of Posa Creek, I rode for a distance of some eight miles through immense numbers of crickets, many hundreds to the square rod for all the distance, and traveling in a general direction east and a little north. These crickets are but partially grown. Whether there is to be a general visitation remains to be seen. I have found them in no other locality in the State.

Having thus treated briefly of the various pests and fungoid diseases which beset the path of the horticulturist, it would not be fair to state that all the outlook is gloomy. Such is not the case. However, from the position I occupy it is my duty to present these facts with the hope that the orchardist, *knowing* the dangers to be encountered, may thereby be forearmed and make a better struggle, which, I feel assured, will eventually succeed. It is true much is to be done. It is also true that much has been done. The efforts made in the State have not been in vain, and the funds devoted by the State to this purpose have been well set apart.

Many subjects demand attention which cannot now be treated of, and I shall confine this report to the subject-matter already pre-

sented. In the way of suggestions it seems proper to say that the coming Legislature should, by an increased appropriation for the purposes of this Board, enable it to do a still greater work than heretofore. The efficiency of the Board is hampered by the fact that no provision is made for defraying the necessary expenses incurred by members in traveling to the required meetings of the Board. This provision should now be made. Also, while expressing to you my high regard of the services rendered by the Secretary of the Board, wherein the law has brought his duties into intimate relations with this office, I beg to suggest that the salary of the Secretary is entirely inadequate, and that it should be made sufficient to afford subsistence to a most valued officer.

Again, I wish to suggest that the law should be so amended as to permit of holding, not only a general State Convention of Fruit Growers annually, under the direction and control of this Board, but also that certain District Conventions, comprising three each year, be held, one in the southern portion of the State, one in the central, and one in the northern. At these conventions the members of this Board should be present. For these and many other reasons there is necessity for an increased appropriation.

Touching the interests of the fruit growers of the State, it is to be hoped that, to a sufficient degree, the industry may receive the protection of the Government of the United States, and thus one of the most important pursuits of the country fostered, while a contrary policy will, in my humble judgment, tend to retard and hinder its full development by bringing directly into competition with its industrial classes the *cheap labor* of the Chinese, as well as of other foreign countries. I also desire to call the attention of the various transportation companies of this State to the fact that provision should be made to carry into the eastern markets, more particularly the fruit products of the State, at as low rates as compatible with their interests, realizing the fact that upon this will depend, to a very great degree, the future prosperity of this growing industry. In this connection it is right that the fruit grower should expect a fair and profitable sum for his products, while not demanding an exorbitant price. Another suggestion is here appropriate: that the middleman, and particularly the retailer, should demand from the ultimate consumer only his fair proportion of profit for such handling of fruits. There is no question but what oftentimes the retailer secures the lion's share, and the consumer is led to believe that all the fault of dear goods rests with the grower. Could all these various interests—producing, handling, transporting, and retailing—connected with this great industry, be brought into harmonious relations, then there need be no doubt of the immense value of horticulture to the individual, the State, and to the Government.

Pertaining, also, to the supply of all fruit products, there should be an accurate representation of the contents of every package, and the Congress of the United States should enact such laws as will compel the information upon all packages of the substances composing their contents. This to the end that adulterations and frauds may be detected and punished, and thereby the producer and consumer be properly protected.

REPORT ON HORTICULTURE, SANTA BARBARA COUNTY, BY PRESIDENT ELLWOOD COOPER, DECEMBER 17, 1884.

The planting of trees in this county has not increased beyond a healthy condition, and keeping pace only with other industries and the increased population. Probably not over one half of all the trees are now bearing fruit—and yet in gathering the last crop a scarcity of labor existed, so that the labor question should be carefully considered before people rush wildly into extending the fruit product. Also the question of what the probable consumption would be at reasonable prices, so as to insure a market, and still more important is the ravages of insect pests, which have increased to an alarming extent. There is no disguising the fact that information or knowledge to keep in check this destructive element has not kept pace with the tree planting, and so long as this condition exists, so long must financially disasters be expected. In Santa Barbara the *codlin moth* has not been found except in one locality, and there not to any very great extent, so that with the knowledge of treatment, and wise regulations, the apple and pear could be profitably grown. The *Curculio* has not yet appeared, and consequently the plum family are so far secure and are made profitable crops. The apricot does remarkably well, but is subject to the ravages of the Black Scale; experience alone will develop the result of the insect on the trees.

The olive is a rapid grower, and bears abundant crops. It would seem to be the tree, of all others, that should claim the attention of the people, and the planting be encouraged. There is, however, much yet to learn to enable the grower to keep his trees free from the black scale. No other tree seems to yield so readily to the attack. The increase is so rapid, and the insect so persistent, that it is yet a question whether, in large areas closely planted, it can be kept in check at a cost that the fruit will warrant.

The citrus fruits do remarkably well, but have still a worse enemy than the olive—the *Icerya Purchasi*, or cottony-cushioned scale. This insect is gradually extending, and until more is known about it, and more decisive remedies applied, and greater success in combating it, all planting should be discouraged. The two largest orchards in the county present a horrible and most disgusting appearance; and it is not only the orange, lemon, and lime, but a variety of other trees may suffer a like fate.

Positive law should confine this pest to its present limit, and from that limit remove it at the earliest possible moment. No sacrifice will be equal to the sacrifice of delay.

People in the county, as well as through the entire State, need more knowledge on the subject of insect pests, remedies to destroy them, etc. Some means should be devised so as to place such information in the hands of every fruit grower, to awaken an individual interest. The future prosperity of the State would warrant the expense. Fruit growing cannot be extended very greatly unless intelligently directed and with the greatest possible care.

REPORT OF DR. EDWIN KIMBALL, COMMISSIONER AT LARGE.

Legend and the Book of Books tell us that fruit growing was the first calling of the parents of our race—before harmony and peace were destroyed, and the race had commenced in sorrow and strife its long march down through untold generations—"and the Lord God planted a garden eastward in Eden, and there he put the man he had formed. And out of the ground made the Lord God to grow every tree that is pleasant to the sight and good for food; and a river went out of Eden to water the garden; and the Lord God took the man and put him into the garden to dress it and keep it." If this is only a myth, growing out of the longings and experiences of the world's most ancient philosophy, it is at least in harmony with the story of human life, since the world's great and weary ones have laid aside the purple and the crown, and have sought under the orchard boughs and the fruitful vine contentment and peace. There is a pardonable pride in looking on the bright side of fruit culture here in California. It is the most pleasing and fascinating of all pursuits. The vast possibilities that lie hidden in the tiny seed and the simple nut, from the period of germination to fruition, are as interesting almost as the birth and progress of kingdoms. To the pioneer, the wonderful growth of trees and vines was like a miracle, and when the ripened fruit of crimson and gold rewarded his labors, it was a new revelation. To our virgin soil the pilgrims of all the earth have brought their richest gifts of fruits and flowers, and for a score of years California has been considered the fruit grower's paradise. Fanned by the warm breezes of the Pacific, she has escaped practically those periodic frosts that vex the fruit growers in the north and west; possessing all shades of climate and varieties of soil, she commands twenty degrees of latitude in the variety of her fruit product.

The coast counties, with their almost changeless temperature, are the home of the whole berry family, the apple, pear, plum, prune, and cherry, and shade off to the east into the production of apricots, peaches, nectarines, and grapes. The interior valleys, shut out by the Coast Range of mountains from the ocean air, produce grapes and peaches almost in perfection, in addition to nearly all the other fruits that ripen early, and command the early home market and the Summer shipping trade to the East; and last, though in the future not the least, are the thousand foothill ranges, where the whole family of temperate and some semi-tropical fruits flourish according to altitude, of gorgeous color, most excellent flavor, and rich aroma. Nature has given into the keeping of the Golden State treasures richer and more enduring than those vast mineral deposits that quickened commerce and revolutionized the business world. As the product of treasure has decreased, the wealth of orchards, vineyard, and a hundred industries have increased, which, added to the product of the vast area in grain, has swelled the volume of our products until a thousand ships and daily trains are required to place the immense aggregate before the consumer at the East and in foreign lands. For the last five years thousands who delight in the culture of fruit have turned their

attention to its production throughout the whole State. Vineyards and orchards cluster in all our northern and central valleys and look out from every glen and sunny nook of our hills and mountains. Vast irrigating enterprises are contemplated in the upper Sacramento Valley and the central portion of the State that will change immense areas of land from grain and pasturage into vineyards and orchards; orange, lemon, and lime trees have been planted by millions in the southern counties, while the apricot, peach, fig, raisin and wine grape, apple, pear, etc., have not been neglected. Every mountain stream and spring is being used to irrigate and reclaim to fertility and productiveness vast tracts of land that was nearly barren and a few years ago considered worthless for cultivation.

Our home market is more than supplied, and the orange growers are now reaching out to the north and east for a market for their surplus that each year is destined to produce and increase. The reduction of freights in some distant future to the northern territories and the East will undoubtedly help their market, but the reciprocity treaty with the Mexican republic will place in active competition to that section of our State, oranges, lemons, and limes grown by cheaper labor, and in a climate and latitude more favorable to their perfect growth and development, and nearer the great central market of the nation than to Southern California. Our adventurous countrymen already are large owners of the most fertile lands of the republic, and will soon help to swell the vast production that will make the orange and other tropical fruits as common in the United States as the apple and pear. The grower of the raisin grape and the currant have the active competition of the grower of those fruits in southern Europe, and the French, who are rapidly developing the wine and raisin interest in Algiers. The production of plums, prunes, and apricots has now reached such dimensions as to cause the anxious inquiry on every side as to what shall be done with the vast product now produced and the thousandfold increase of the near future. We have hitherto supplied our own State, the adjacent territories, and have made shipments of canned and dried fruits to eastern cities, to St. Louis and Chicago, and other cities in the west, for general distribution. But the territories of Idaho, Montana, Arizona, and New Mexico are soon to raise their own fruit. The hardy fruits flourish in Montana, Idaho, and parts of Wyoming, as well as in Ohio or New York; while apples, pears, peaches, apricots, and grapes will soon be raised in excess of home demand in Arizona, Utah, and New Mexico.

If we are particularly favored in climate and soil for the production of fruits, we must still remember that the great East, with its fifty million of population, its great wealth and varied soil and climate, may, with but little exertion, produce more than can be consumed. Greater care is being taken of orchards in the north and west, and, notwithstanding the ravages of the codlin moth and unpropitious seasons, they always produce apples in excess of consumption, and have been large exporters for twenty-five years to England and the Continent. Pears, owing to the blight, are needed in supply in some parts of the East; but Arkansas, Kentucky, Tennessee, Northern Georgia, and Alabama, the Western Carolinas, and Virginia, can produce pears sufficient in ten years to supply the world. The peach is being raised in large quantities in the valley of the central and

lower Mississippi and southern Atlantic States. While the experimental orchards of practical men have demonstrated to a certainty that the States just named are particularly adapted to the profitable growing of nearly all our temperate fruits, the production of choice orchard fruit will necessitate here from this time forth labor and ceaseless watchfulness. The apple and pear will hereafter reward only those who are diligent and thorough in the destruction of the codlin moth, while the scale that has been so industriously disseminated by our San José friends has its representatives in thousands of our orchards—from Shasta to San Diego. We have the pests of the entire world, and from present appearances they have come to stay. Peculiar seasons will undoubtedly produce phenomena adverse to our peach, plum, apricot, and prune orchards, but in the main we may reasonably expect a steady production that will require thousands of laborers that we do not possess, to harvest and prepare for distribution. The millions of trees now in bearing and growth will be reinforced this coming Winter with as many more, and our nurserymen have still in supply vast quantities for the year to come. The question of supply and demand will soon be an interesting one to the fruit grower. Diligence and labor may keep the orchards healthy and productive, but then to the problem of saving the vast product, must be added the greater problem for solution of profitable sale and distribution. Examples of phenomenal orchard production, of past high prices, and the supposition that the whole wide world is to be our market, from the poles to the equator, has so stimulated the planting of orchards and the inquiry for orchard lands, that lands have advanced in many locations from one to five hundred per cent in valuation, based wholly on their supposed adaptation to the profitable culture of fruit. Hundreds of thousands of trees have been planted in soil and localities not congenial to their growth and productiveness, and inexperience and infantile trust in silver-tongued land agents, will result in the planting of thousands of acres more to swell the chagrin and disappointment that must inevitably follow.

Men in whom the joyous faculty of hope predominates see in sweet perspective new and competing lines of railroads to the East and scores of trains daily sweeping over the Sierras laden with our ripened fruit. They behold also the isthmus pierced with ship canals and swift sailing steamers bringing to the Atlantic seaboard cities, Europe, and all the world, our canned and dried fruits. It will be well for such to remember that this is a progressive age and that there are other lands as sunny and fertile as ours. South America, from the twenty-eighth degree of latitude to the fortieth, is the natural climatic home for fruits. At the commencement of the century, peach trees grew so luxuriantly on islands in the great River La Plata that its wood was almost the only fuel used in Buenos Ayres, the metropolis of the Argentine confederation, and now orchards and vineyards abound from fertile beautiful Cordova to the City of Mendoza, hidden in the haze of the western Andes. The tide of English and German emigration has flowed so fast and free that the slumbering energies of the natives have been roused to action. Railroads have been built, new lines are building, and the wine and fruit product will soon be noted in the markets of the world; while to the west, looking out on this peaceful ocean of ours, the sons of the Purvean Conquerors sat under their vines and fig trees a century before the Jesuit Fathers

founded the first mission in California. South Africa is preëminently the land of fruits and vines, and thirty-one years ago I purchased in the City of Cape Town, for two pence ha'penny, at retail, as fine raisins as were ever shipped from Spain or the Grecian Archipelago. In Australia the vine flourishes and the vineyard area is a large and increasing one; while Tasmania to the south can furnish apples, pears, peaches, plums, and cherries in quantity to supply the Australian continent and the islands of the sea. The people are of enterprising Saxon stock and no industry is more popular; the canning business was inaugurated years ago and is fast increasing. New Zealand, the Britain of the southern sea with her soil of wondrous fertility and mild climate, has vast possibilities in her young and growing orchards, if such should prove profitable. To the north in India, "the summit of the world, the abode of light," looks down from his icy throne of the Himalayas, on the vales of Cashmere and the valleys of Shiraz, the old homes of all the fruits and orchards and vineyards that now dot the great grain fields of the table lands of the Indus and Ganges. In fact, just now the world over, fruit growing has become a leading industry, and even in England large areas have been planted with the apple, the pear, and plum during the last five years, and should the tenure of land be changed in the United Kingdom to smaller holdings, tens of thousands of acres more will be planted. The Yankees will have to eat their own pippins, drink their own cider, and eat their own canned and dried fruits.

The wonderful results of fruit growing here have come from ceaseless care and labor, such as the eastern grower has never given to his orchards. The margin of soil and climate is in our favor as against the eastern grower; but that it is our mission as a State, to supply the east, south, and west, and the whole world with fruit, is a preposterous idea that the future will soon dispel. Modern facilities of communication have stimulated the exchange of commercial commodities the world over, and the dates of Bassora and Aden are now found in every country of Europe, and in every hamlet of our land from the Atlantic to the Pacific. The wonderful progress of the mechanic's arts of labor-saving machinery in cultivating the soil and manufacturing its products, the enterprise that has sought out new lands for development, has given to all mankind a richer and a broader life. The European peasant of to-day fares better than a medieval prince, and famine is almost unknown. If pestilence threatens, or catastrophies crush, the electric messenger wakens the world, and civilization responds with swift and substantial aid. Railroads have made famine impossible in India, and Indian wheat now makes the price for the world. Europe, with her cheap labor and experience, can furnish the whole world with prunes for four cents per pound and become rich. Spain, Greece, and Italy will be glad to supply all christendom with raisins for their puddings at almost as cheap a rate, and the ocean is their highway, while we must pay a proscription toll on the way to our own markets. It will soon be obvious to California fruit growers that we are hardly on an equality, as to labor and transportation, with the rest of the world. The planting of orchards and vineyards should correspond with the supply needed on this coast and the probable demand for eastern and foreign consumption. A larger supply will surely result in overwhelming disaster. An area of plums, prunes, and apricots is already planted more than sufficient to supply the demand for twenty years. Two

hundred and fifty thousand tons of apricots will be a moderate estimate of the annual supply in eight years. The production of plums and prunes will be correspondingly large, for to our own product must be added the already large and increasing area in Washington Territory and Oregon. Our vineyards of table grapes, with reduced and swifter freights, are full of promise, while the millenium is just now seemingly so far in the future that the producers of wine grapes will continue to increase their vineyards for generations to come.

The time has come to take a careful survey of this great interest, not only of the material danger of disease and insect enemies threatening many of our orchards, but of the important financial problem connected with the industry. Fruit is surely in the future destined to be cheap and in over-supply; but, if our finances suffer, we may console ourselves with the philosophical reflection that, if our pockets are lighter, humanity wins. That our orchard interests may bring comfort and abundance to the husbandman, and may rest on a sure and safe foundation, is my most fervent wish. Our State is broader and wider than ten years ago. New industries will spring up on every side. We must plant the almond and nut-bearing trees in quantity, to shut off the importation of all foreign nuts that can be raised here. We must increase our flocks and herds. Large areas should be sown in alfalfa—the king of all the forage plants. Textile plants should be planted. Cotton, hemp, and jute can be profitably raised, and in quantities to supply our own manufacturers. The olive, the emblem of peace and fullness, should be widely planted. It will flourish from the extreme south of the State to Shasta, and from the foothills to the sea. And last, there should be a hearty honest coöperation among all growers of fruit, and all interested in its distribution and manufacture, in pushing our products, and in properly preparing the vast supply for consumption. Our Legislature should step up to a higher plane of duty and pass such laws as will render possible the protection of our orchards. Enterprising agents should be sent to Europe, and liberally provided with funds, to promote the emigration of its most industrious peasantry; and when the last Chinaman, as in time he must, shall rest from his labors here, or pass over to the Celestial kingdom, send with him all the swine, from which his manhood and religion springs, and with it the whole foul product—scrofula and physical evils—that curse the race, then our orchards shall smile under the hands of intelligent labor, and from our olive presses the oil of strength and gladness shall fill its place, and we and our children shall dwell together in the land forever.

REPORT OF COMMISSIONER MILCO FOR THE SAN JOAQUIN DISTRICT.

The vast extent of territory in my district, now producing only a few million dollars' worth of cereals will, in the near future, be converted into an immense orchard and vineyard, great progress having been made during the past year. Go to Fresno if you wish to know how it is done, and do not look any more for great profits on wheat, for where you only realize \$10 per acre on wheat, you can easily convert it into \$40 or \$50 in fruit or grapes, and then sell your product for one half of what it is sold for now, though we cannot expect \$300, \$700, or \$1,000 per acre so often reported in newspapers.

As the most practical method of

ADVANCING OUR HORTICULTURAL INTERESTS

I cannot too strongly recommend that large tracts of land should be subdivided, and sold in allotments to skilled orchardists and vineyardists. Then make fruit and grapes the main productions in the future. Suppose the combined rivers and all the possible artesian wells are able to irrigate 1,000,000 acres in the San Joaquin Valley, placing it at the low estimate of \$50 per acre, and we derive a profit of \$50,000,000 per annum, a much larger revenue than the whole State now receives from all its agricultural products. What we must have is cheap fruit and wines, so that the people at home and abroad may be able to purchase our productions. Wine and water is the most salubrious of all drinks known, and if it were used instead of beer and whisky it would be better for all, and we would have no drunkards, but strong, healthy, and long-lived people, such as we find in the wine-producing countries of Europe, where drunkards and tramps are unknown.

Only people living in our beautiful San Joaquin Valley can be expected to believe in the possibilities of our future. We see that immense amounts of money have been spent in the building of canals in Kern, Tulare, Fresno, and Merced Counties, but we must not stop here; the waters of the Tuolumne, Stanislaus, and Mokelumne must also be utilized, and by concerted efforts the great San Joaquin Valley converted into one great orchard and vineyard. In order to go in the right direction when we do that, we must not plant anything and everything, but accept the counsel and advice of men of knowledge and experience in such matters if we wish to succeed. Only one man in ten succeeds in orchard and vineyard planting; the others do not attend the Horticultural and Viticultural Conventions or read the reports of the proceedings. Before such men plant a single fruit tree or grapevine they should read the *Pacific Rural Press* and *San Francisco Merchant*, and above all, only purchase stock from a reliable nurseryman, instead of ordering from an itinerant peddler who has neither nursery nor conscience, and whose bogus catalogue contains every variety known to the trade, but whose stock is com-

posed only of that discarded by the general nurseryman. Select such varieties as will pay to cultivate, and, if not posted, consult your Commissioner, or some successful grower, and he will put you in the right road. It costs no more to raise Bartlett's than it does Flemish Beauties; the former will always sell at profitable prices, while the latter will not pay for picking.

Among the fruits that will flourish in the San Joaquin Valley, and from which those intending to engage in this industry can make their own selection, I enumerate the following, which are by no means all that can be grown at a profit: Apples, pears, peaches, nectarines, apricots, plums, prunes, cherries, quinces, figs, pomegranates, almonds, walnuts, olives, strawberries, blackberries, raspberries, and grapes. Some of the finest oranges, too, are grown in small quantities in some parts of the valley.

PROGRESS IN SAN JOAQUIN.

Horticulture has made great strides in certain portions of my district, though San Joaquin County has made but slow progress in that direction, and wheat still retains its position as the leading product. There are some model orchards; however, along the San Joaquin, Calaveras, and Mokelumne Rivers, ranging from two to fifty acres in extent, and many small ones in the vicinity of Stockton. The low price of wheat the present season has aroused the attention of the farmers of this section and convinced them of the necessity of engaging in more diversified pursuits, and I hope next year to be able to report a marked improvement in this respect.

But little can be said of Stanislaus County, there being but few orchards or vineyards there, and those located around Knight's Ferry and along the Stanislaus River, her people being noted for their devotion to the cereals.

In Merced County, like Stanislaus, the population is mainly engaged in that branch of agricultural production—orchards and vineyards few and far between. The greatest number is along the Merced River, near Snelling, with an occasional orchard on the plains. The most prominent is the buhach plantation, embracing seventy-five acres, which will be increased to four hundred this year.

Fresno is the banner fruit county in the district, and will at no distant day rival any county in the State. Her people have so much push, sagacity, thrift, and genuine enterprise, touching the particular branch of industry, that their land to-day sells for double and treble the amount similar land will bring in Stanislaus and Merced Counties, although the latter are much nearer market, and have equal advantages in climate, soil, facilities for irrigation, and other necessary conditions for profitable culture. A visitor may drive for days through the beautiful avenues, bordered by hundreds of orchards and vineyards, following each other in almost unbroken succession, giving relief to the eye of the beholder, and forming a marked and pleasing contrast to the arid plains and monotonous wheat fields of some of the neighboring counties.

Tulare County is also bidding for recognition, and has long ago stepped forward in the right direction. A great many orchards, vineyards, and beautiful homesteads have sprung up as if by magic in many portions of this truly rich country. The coming season for

planting gives promise of an immense increase in horticultural efforts.

Kern County, also from a barren desert, has leaped into life, and thousands of acres are to-day green with alfalfa, cotton, fruit, grapes, and almost every other product that is within the grasp of the progressive husbandman. Kern will soon take a place among the leading counties in fruit culture, her people being thoroughly awake to the situation.

My twenty-one years' constant connection with the fruit industry, as a fruit dealer and fruit grower, I think gives me many advantages in judging intelligently what to plant and how to plant, in order to meet a ready and remunerative sale; and when I speak of fruit I wish it understood I mean all kinds grown here, grapes included. It may not be amiss to state that I and other nurserymen have introduced, propagated, and cultivated so many new varieties of fruit trees, plants, and vines of the best varieties, that the importation from Europe of white figs, olive oil, and many other articles of commerce, will soon cease to be remunerative, and that the home supply will fully equal the demand, besides furnishing an article superior to the one imported.

I shall say nothing about insects, because all know I am their greatest enemy, but trust the Inspector of Fruit Pests will give you all the important points on the subject. I hope that we may by private subscription raise a sufficient sum for the endowment of a Chair of Entomology—one who will be everybody's entomologist, embracing agriculture, horticulture, viticulture, sericulture, floriculture, live stock, etc., similar to the other State Entomologists—one who will study the habits of insects and prescribe true and proper remedies, instead of a closet professor and theorist, who will ride his own hobbies and scout the experience of practical men.

FIGS.

As I have taken great pains in introducing the first white figs of commerce into California, including the San Pedro, the largest, earliest, and finest table fig in existence, I think it proper to append directions for drying, trusting that we may in future help and divide with each other all the new varieties, mutually disseminate information, aid in the organization of local horticultural societies, and promote the circulation of papers like the *Pacific Rural Press* and *San Francisco Merchant*.

Figs should be picked when the skin is fully checked—that is to say, showing small white seams upon the surface—by which time the fruit has reached its maturity. It must be dried upon trays in the sun. Care should be taken that they shall be turned over at least once a day, until the greenish tinge entirely disappears, when they are ready to be taken indoors for packing. While drying, the figs should never be left out in the open air after five o'clock p. m., nor should they be exposed to the sun again until the dew is dispersed in the morning, as the least moisture will entirely spoil their flavor and appearance, and render them unfit for use. Avoid packing windfalls, because they are utterly worthless for commercial purposes, and will greatly detract from the value of a whole consignment—perhaps lead to its final rejection. Before packing, the figs should be hastily dipped in clean boiling-hot sea-water, to guard

against all danger of attack from the worm so destructive to the fruit; then properly packed and thoroughly pressed in tin cans, hermetically sealed and labeled. In all cases the fig should be left in its natural state, and sugar or other confections discarded.

These directions must be strictly observed if you wish to obtain a choice article that will command ready sale and top prices in the market. Even our common black fig, treated according to the above method, will "astonish the natives."

Herewith I also submit, for inspection and comparison by members of the Commission, specimens of white figs, both green and dried, grown in Merced County, which I consider equal, if not superior, to any of the much vaunted varieties.

Respectfully submitted.

G. N. MILCO.

Report from the Commissioner of the Second Horticultural District of the State Board of Horticulture,

COMPRISING THE COUNTIES OF NAPA, SOLANO, AND CONTRA COSTA.

The undersigned, Commissioner of the Second District of the State Board of Horticulture, begs leave to report to your honorable body as follows: That the past season has been one of prosperity to the fruit growers generally in the Second District, the County of Napa excepted. So far as the horticultural interest is concerned, Napa has not been so successful as that of portions of Solano, owing to the failure or blight of the pear crop and the destruction by the codlin moth of the apple crop, but few localities having escaped the ravages of that dreadful pest. The peach and plum crop was very good, especially the former, the yield of the plum crop being simply enormous, and seemed to withstand the ravages of all pests better than any other class of fruit. The cherry crop was a partial failure, although some of the best cherry orchards yielded well, but was slightly injured toward the latter part of the cherry season by the heavy rains, causing much loss to the producer by the bursting and rotting of the fruit. Other fruits, such as the apricot, do not succeed so well in the district of Napa as in portions of Solano. The cultivation of the prune in California, and especially in the counties of Sonoma and Napa, is receiving more attention at the present time than any other variety of trees, as the amount of young trees planted during the past three years will testify. There has been no less than 500,000 trees of this variety planted in the Counties of Sonoma and Napa during the past two years, and probably as many have been planted in Santa Clara County, as I have been so informed by the agent of one of the principal nurseries of that county, where the prune first met with favor at the hands of fruit growers. The prune seems to thrive well in most parts of the State where other fruits grow and bids fair to be the leading fruit of this State at no distant day. There are several varieties of prunes, but the one that this report refers to is the petite prune, D'Agen, or what is commonly known as the French prune, it being of small size and sugary, perfect shape, a very profuse bearer, and requiring simply drying in the sun or drier to prepare it for market, there being no pitting or extracting of the stone, as in the case of the peach, plum, or apricot; and the loss in process of drying or evaporation is very small, being much less than any other fruit commonly dried for market. One pound out of three can be obtained in every instance, and since the cost of transportation is much less than canned fruits—and cost of curing less than any of the other dried fruits—and as the prune has a great market value, it is safe to say that in a short time California will be as much celebrated for prune growing as is now the countries of France and Germany. The number of trees planted in an acre is usually from one hundred and seventy to one hundred and thirty-four, they being of small size at maturity therefore will bear close

planting. An average yield of fresh prunes per tree, at five years, is about fifty pounds; price varying from ten to fifteen cents per pound when dried.

The *Curculio* that has made such ravages in the plum orchards in the Eastern States has never made its appearance on this coast, and until it does the prune grower need have no fear of the pest common to this fruit, unless the San José scale attacks it, and it is not certain that it will not escape that pest. These remarks are intended principally for the new-comer and those who desire to engage in fruit culture whose means are limited, as a greater profit can be realized from the culture and production of the French prune in California, with a less outlay of capital, than from any other standard fruit. The tree will thrive and do well in any portion of this State, and when California becomes more celebrated for growing this fruit, the price will naturally increase. Small capitalists will find this fruit more profitable than anything in the horticultural line, as fifteen or twenty acres of this fruit at five and six years old equal, if not greater, in point of profit than a section of wheat or grain of any kind, and the care and anxiety much less than the grape or any other variety of fruit. Mr. R. D. Fox, of San José nurseries, has furnished many thousands of these trees, they having a specialty of this class of fruit.

Respectfully submitted.

W. M. BOGGS,
Commissioner for the Second Horticultural District of the State of California.

SAN FRANCISCO, December 17, 1884.

REPORT

OF

FOURTH ANNUAL STATE FRUIT GROWERS' CONVENTION.

This report is here published to the extent allowed, and while not entire, it is hoped that many of the important subjects under discussion are presented so as to result in benefit to the fruit growers of the State.

The full stenographic report of the Convention may be found published by the *Pacific Rural Press*, by the authority of the State Board of Horticulture.

FRUIT GROWERS IN COUNCIL—FOURTH ANNUAL CONVENTION.

The State Convention of Fruit Growers was called to order in the rooms of the Chamber of Commerce, September twenty-ninth, by G. N. Milco, a member of the Board of State Horticultural Commissioners. The Convention organized by the election of the following officers: President, E. W. Hilgard; Vice-Presidents, J. V. Webster, W. C. Blackwood, and A. T. Hatch; Secretaries, A. H. Webb, E. J. Wickson, and A. T. Perkins; Treasurer, R. J. Trumbull. Upon taking the chair, Prof. Hilgard expressed his opinion of these conventions each year, that an increasing number of prominent fruit growers would attend the meetings for the purpose of an intelligent discussion of their great industry. He then suggested that a committee on order of business be appointed to report on topics for discussion and other business. The following were appointed: E. Kimball, F. C. DeLong, W. C. Blackwood, A. T. Hatch, and Dr. John Hastings.

FREIGHT ON FRUIT.

PRESIDENT HILGARD suggested that a committee be appointed to represent the convention and act with a similar committee from the State Horticultural Association, to confer with the railroad authorities on the question of freight rates to the East on fresh fruit. "This question," said Prof. Hilgard, "is one which is rapidly assuming the proportions of the turning point on which is to be decided the future of the fruit-growing industry. The fruit growers are already much interested in this important question, and it is high time to agitate it intelligently."

MR. MILCO moved that a committee of three be appointed on the subject. He said that it had been his experience that the railroad people always met a business proposition in a business manner.

MR. HILGARD: It is thought by men who have most deeply studied the problem, that at the present rate in the increase of fruit produc-

tion fruit growing cannot be carried on as a profitable industry in this State if the railroad will not reduce its rates on fresh fruit so that California growers can fairly compete for the eastern market.

MR. HATCH: We have only to ask, I believe, to get such reductions as we are entitled to. We may be as well treated as the orange growers of Los Angeles County were, who got a greater reduction than they asked for, getting their fruit sent East for \$200 per carload, whereas \$400 is charged for pears from the northern part of the State.

THE COMMITTEE'S POWERS.

MR. WHEELER: The trouble is, the fruit growers have never approached the railroad in a business-like manner. Your committee must be prepared to agree to send a specified number of carloads per day, and then the railroad people will agree to take them for a certain sum.

MR. BLACKWOOD: It is perfect nonsense to talk of a committee going to the railroad people and contracting to send a certain number of carloads a day, or in any specified time. No committee can control the actions of the fruit growers. And that, too, is going about the business wrong end first. It is not for the fruit growers to encourage the railroad people in railroading; it is for the railroad people to encourage the fruit growers in fruit growing. The railroad *must* encourage the fruit industry, by giving us rates at which we can lay down our fruit in New York and Chicago at a profit to ourselves as well as to the railroad. The railroad has it in its power to open the eastern market for us, and when they do that there will be no need of their holding back, asking us to contract to send a certain number of cars. We will, of course, send our fruit East by the railroad—we can't send it in any other way—as soon as the railroad makes it possible to enter the eastern market on fair competing terms.

MR. HATCH: We already have given the railroad a guarantee in investing our money in this enterprise of fruit growing. We raise fruit and must send it to the market, but we can't force the railroad to do anything; nor is that the way to go about it. It is not a question of forcing. Show them that it is as much to their interest to take our fruit as to take Los Angeles oranges, and they will do it.

MR. WEBSTER: This talk of a guarantee is simply evading the question. What we want is a uniform rate. We are charged \$400 per car for our fruit and Los Angeles is charged \$200. Is it necessary to tell the railroad people that this is an injustice? The question of injustice is not what is going to settle it. Governor Stanford told us long ago what it was that settled the Central Pacific freight rates, when he said: "Our charges are what the product will bear." They lowered the rate on oranges because that product would not bear \$400 and compete with Mexican oranges. They are governed by no other consideration, as we all know, and they will give us a lower rate only when they are compelled to, by being convinced that the industry will be killed by the present rates. We should insist—must insist—upon uniform rates. Something has been said here about going to the railroad in a business-like manner and not telling our grievances to the newspapers. I tell you that our only hope of relief is through the assistance our cause will get by agitation aided by honest newspapers. The fruit industry is too important to the future of this State

to be suppressed. We must have an outlet for our fruit. In ten years this State will raise fifty times more fruit than is needed for home consumption, and the eastern market must be opened for us.

MR. PRYAL: We will have half a dozen railroads in time; that will settle it.

MR. HILGARD: But what are we to do in the meantime?

MR. MILCO: The railroad people must be alive to the necessity of an eastern market, for they themselves are becoming fruit growers on a large scale, and are investing their money in an enterprising manner for the development of irrigation facilities and the extension of orchards and vineyards.

The convention adjourned until Tuesday morning, at half-past ten o'clock.

TUESDAY, SEPTEMBER 30.

The convention was called to order at fifteen minutes past eleven A. M., Judge Blackwood in the chair. The Chairman of the Committee on Order of Business reported as follows:

DR. KIMBALL: The committee have met and they have instructed me to make a verbal report that inasmuch as a number who usually have been interested and assembled here, and have had papers and communications that were of interest to all fruit growers and every one connected with the industry, are not here, they have concluded it is best that the convention when they adjourn from this time to some time this afternoon, then take up such papers or communications as they may have and read them, and that the convention then, by motion of individual members, or of any member of the convention, can regulate their own business, that is, select any subject that they choose, and the time and place at which it will be discussed.

Upon motion, the report of the committee was received and adopted.

THE RAILROAD QUESTION.

Discussion was then renewed upon the motion to appoint a committee in conjunction with the committee from the State Horticultural Society, to confer with the railroad authorities with a view to obtain a reduction of freight rates upon fruit products at this season of the year.

DR. KIMBALL: I feel that the appointment of such a committee would be very wise and proper, for it would establish at once a direct chain between the people who want to use the railroads and the people who control them, and whenever we are able to establish a relation that shall be pleasant on the part of the proprietors or operators of these lines of transportation and the individuals that must of necessity use them, why then, we shall be on the way towards the happy camping ground of the fruit growers. And I subscribe most heartily to the motion that was made that we as a convention of fruit growers of the State of California, shall appoint such a committee. They should be a committee of level headed men, not radicals or so ultra that they can't express an opinion to a man without getting him mad. I believe there is a way to accomplish all these things, and if the fruit growers of this State go to work in the right spirit and show it is for the interest of these great transportation

lines to do what is honest and just and correct, and will best protect the great fruit interest of this State, that in so doing they build themselves up, we shall produce results that will not disappoint us.

RAILROAD AND GROWERS' INTERESTS MUTUAL.

DR. CHAPIN: I most heartily concur in that motion, and hope that such a committee will be appointed. It is very proper, and it would be a profitable move for us, as a convention of fruit growers, representing the whole State and the interest of horticulture throughout the State, to meet together, and meet with the railroad managers and transportation companies which are carrying our products from this State to a large country, and lay before them from our standpoint, in a careful manner, with an unprejudiced view, what we think will not only be for our interest, but mainly for the interest of the transportation companies eventually, which it certainly must be, to provide transportation facilities at as low a figure as can be done and leave them a reasonable compensation, for the transportation of the products of our orchards and vineyards. It will come to that eventually without any doubt, and we may perhaps hasten the day by pursuing this considerate course at the present time. Unfortunately many times dissensions arise, and they place difficulties between those who are carrying our products away and those who produce, and thus hinder the work which we would like to see accomplished. I really believe the railroad company would be glad to do all they can to favor our interest in the State. It would certainly be for their interest to do so, and their action with reference to the carrying of our products for exhibition at New Orleans, at this coming World's Fair, is a most noble action, which shows a generous spirit, and I, for one, heartily thank the railroad company for what they have been willing to do in this matter, and I certainly hope that the fruit growers in this State will consider it in the same spirit. If we feel that there is not such a divergence of interest between ourselves and the railroad companies, we may perhaps accomplish far more good for ourselves by meeting them in that spirit; and I hope that we may find it possible to make arrangements by which transportation can be reduced very materially, and by which greater accommodations can be brought about to provide for the carrying of our fruit away from the State. We actually need a regular daily fruit train running on fast time and at low rates of freight, to carry our fruit away and put it into the markets of the Eastern States, and thus provide for the surplus that we will have in a very short time to handle. If that is done, I have no fear then that we can find an outlet in the market for our fruits, because immense quantities of fresh fruits that cannot now be handled at all, or be taken out of the State under the existing circumstances, can then be sent away with profit to ourselves as growers, and with an immense increase to the funds of the railroad company. I believe that this can be brought about if undertaken in the right manner and in the right spirit.

MR. JESSUP: I heartily indorse the views of Dr. Chapin and Dr. Kimball in this matter, and I think that it is a very important matter that we should meet the railroad company on harmonious grounds, and I am satisfied, so far as my knowledge goes, that the railroad company is anxious to do all they can in this matter. I was appointed

on a committee with the doctor and a member of our society from Mount Eden Fruit Growers' Association of Haywards, to wait on the railroad company, and they expressed willingness to reduce their freights, but stated at the same time that the proposition never had been made. I asked Mr. Pratt what he intended to do. I said: "When we consider that we haven't got over one and a half to two per cent of the entire field planted in the State to-day in fruit, you must concede the enormous quantity of fruit that must be removed and transported before the next eight years." Said I, "The question remains between you and me. What are we to do? Are we to lose the fruit and you the freight?" He said, "What do you want?" I said, "We want cheaper rates to the East. I have no doubt from my own knowledge that we can send a train every day if we can land it in Chicago or St. Louis from two to two and a half cents a pound. We want it to go there on fast time, and without any doubt we can start from one to two trains a day of fast cars, if we can put down freights by it." "Why," he said, "the proposition has never been made in that way," and asked me to urge upon the societies of the State to come to some definite conclusion and make the railroad a proposition; that they were willing and anxious to meet us half way in these matters, and I think it is a good proposition of Dr. Chapin's and Dr. Kimball's to get together immediately and meet them harmoniously and talk the matter over. They fully understand and see the importance of it, and that they will be the gainers as well as the fruit growers. I haven't the faintest doubt but we can lay down fruit in any of those Eastern States and in the West, for at least six cents a pound and probably less than that if the railroad can be made to see that it is to their interest to reduce their freights to two or two and a half cents per pound. That, of course, would give them about \$400 a car, but I think they could be brought down to \$250 or \$300 a car. But we must have men that will meet them in a spirit of friendliness; we must have thinking men, and men that will not fly in a passion, or try to control matters themselves.

MR. SHINN: It is hardly worth while to attempt to discuss here the question of the amount that would accrue to the fruit growers of the State if this could be done. In fact, no one can help but see, that considers the subject at all, that the solution of the whole subject of the profits of the fruit grower really depends upon that, and it is proper that we should enter upon the subject in that connection and see what can be accomplished. But there is one thought. We can easily foresee how the railroad people will reason upon the subject. I apprehend they will say, "You are not prepared to give us a train load of fruit every day." That is what is the matter. And we are not prepared, in my opinion, to do that this Fall.

MR. HATCH: If Mr. Shinn will allow me, I would say that we don't propose to do anything of that kind this Fall, but in the fruit season.

MR. SHINN: That is what I was going to say; that it is too late this season to ship fruit around from Sacramento to Chicago on the other side of the mountains, but next season the fruit growers will be able to load every day a train of cars, if not every day, every other day. I understand the railroad has already said: "If we know what to depend upon; if we know what you want, so as to meet it, we will do so, but if we make arrangements to start a train from Sacramento, and you shouldn't be ready, that is the difficulty." At all events, I heartily approve of the appointment of the committee, and will sug-

gest to the Chair that he make it from the State at large, and not confine himself to the Horticultural Society, and to scatter them as much as possible.

MR. HATCH: I don't suppose that we can approach the railroad company and tell them that we can give them a specified number of cars each day, and contract to do that by any means. They have no special contract with anybody or any place, or any part of the country, from which they will haul their cars for any specified price at any time. And yet, if we can show them that the outlook is good to have such a train, if we can get such a rate, they will prepare themselves to do their best. Sometimes they might not have what they would consider a large train, or it might be short of what they would desire, or they would not know whether they were going to have so few or so many cars. The probability is, though, that they would start a train as soon as they were satisfied that the prospect was good for a fair-sized train per day or every other day. I believe that all this committee would have to do with the railroad officials would be to convince them that they would make some money on a proposition of that kind.

MR. HICKSON: I heartily concur in what has been said about this matter in reference to the desire of the railroad to make business. I have for the last two or three years had conversations with a number of the leading men of the railroad in connection with this matter, particularly with Mr. Huntington, in New York, in which he expressed a desire to accommodate the people, and put it upon the ground that it was business; that they wanted freight. He said that they had been hard pressed in building their road south, for rolling stock and such other requirements they were called upon to meet, that they had not been able to do what they expected to do, and I would just here mention the matter of potatoes and onions. They are the particular kind of freight that we can send, and particularly onions. It is an article that always brings the highest price in the western and southern markets, for we can send them a great many if we know we can get cheap freights. I had a conversation only a few days ago with one of the leading men, Mr. Gray, on the subject of dried fruits, and I said that it was putting such a heavy per cent on us to get it to the eastern markets, and when I remarked that two cents was a heavy per cent on ten, he spoke with a great deal of astonishment. He thought that we had no dried fruits that were not worth eighteen or twenty cents, and when I told him that the majority of dried fruits was within twelve cents, let alone eighteen or twenty, he expressed himself as very much surprised. So I think that if we meet with these men, and give them to understand that by putting freights at living rates they would have a great deal more of it to carry, which at present rates they couldn't carry, as a matter of business they would see to it. They tell a story, I believe, of a man that went to them and wanted to know what the freight would be on a certain article, and they asked him what he expected to get for it, and he told them so much. They asked him what he would make on it, and he told them so much. Well, they said, the freight would be the difference. But it is a good point, and I think if the railroad company were pressed as they were a year or two ago, when they were building these roads, especially the southern road, and they were anxious for business, that they would be ready to do what was fair. I know Mr. Gray expressed astonishment that we were only getting ten cents for

plums, and I think it would be a good idea to talk the matter over and inform them of the situation. They probably don't know these things as well as we do in regard to prices.

The Chair then appointed Messrs. Hickson, Buck, and Aiken as members of the committee. Mr. Shinn repeated the suggestion that it would be better to go outside of the Horticultural Society in appointing the committee.

THE CHAIR: I will state my reasons for appointing the committee as I did. The railroad company officers are here in the city, and they have agreed at some time, to give us notice when they can give us a hearing, and it would be inconvenient for people residing at a distance to attend at such a time as they can give us for a hearing. This committee from this convention is supposed not to know anything about the State Horticultural Society. Although they be members of it, they appear on behalf of the fruit growers of the State. Mr. Hatch then offered the following resolutions:

WHEREAS, It is the sense of this convention that the interest of the fruit growers and cannery are mutual, inasmuch as the success of one is the success of the other:

Resolved, That the cannery of the State are respectfully invited to attend this convention and participate with us in the discussion of questions calculated to promote the advancement of our respective interests.

Resolved, The cannery are respectfully requested to indicate some time during this convention when the subjects relating to canning fruits be discussed, and that the cannery are requested to participate in such discussion. And it is intended that they especially invite all cannery within reach of notice, so there will be time to meet with us here during the convention.

MR. HICKSON moved to amend by including in the invitation those who are engaged in the business of fruit drying.

MR. DELONG moved that Thursday afternoon, at 1:30, be the time set for such meeting.

The resolution was then adopted as amended.

MR. DELONG moved that all letters and communications to the convention be taken up and read at this afternoon's session. So ordered.

MR. HATCH moved that a committee of one be appointed to wait upon Colonel A. A. Andrews as the Committee of the State of California at the New Orleans Exhibition, at any time that may be convenient to him, and address the convention.

MR. CHAPIN moved to amend by including in the invitation Mr. C. B. Turrell, of the Central Pacific Railroad. Adopted.

MR. FRANK BUCK was then appointed by the Chair to wait upon the gentleman named, with the invitation.

MR. WEBB moved that an invitation be extended to Mr. Harry Edwards, the entomologist, to address the convention at such time as may be convenient for him. Adopted.

MR. WEBB was appointed by the Chair as the committee.

On motion, adjourned till 1:30 P. M.

For report of Dr. Kimball see page 51.

DISCUSSION.

MR. BLACKWOOD moved that Dr. Kimball's paper be placed on file and published in the society's report. Adopted.

Upon motion the discussion of Dr. Kimball's paper was taken up.

MR. SHINN: I think it is well for the convention to have both sides of that subject before it. The paper that we have heard seems to show up one side of it, and it is high time to open up this question.

We have been working up our imaginations with regard to our fruits so high, that we think we are sure of great fruit prices. It is not so; and perhaps it is well for us to be reminded that there are other countries that grow fruits as well as California. It is well also for us to bear in mind that we are planting trees very largely, notwithstanding we are told that the world is all open for us as a market, and all that. Dr. Kimball shows us that we may be deceived about that. Well, now let us see if that is so. It is so beyond all doubt in a considerable measure. Mexico will be a strong competitor with the southern portion of this State in the growth of citrus fruits; that is evident. A year ago I, with some others, were visiting the southern portion of the State, and after visiting the orange orchards and seeing millions and millions of oranges hanging there, I afterwards called in at one of the houses engaged in the handling of that class of fruit, and said to the owner: "What are you going to do with this business? Haven't you too many orange trees down here? I think you have. I think you have got more planted than you want. You had better go at something else, hadn't you? Why don't you go into raisins, or something of that kind?" He said, "No, sir; I am not a bit afraid." I said, "What are you going to do with Mexico? You know very well, now, that Mexico is open to the trade; and no better oranges are grown anywhere in the world than there. Certainly they can grow better there than you can." He said, "Mexican oranges are grown and ripened before ours are, and are sold and eaten before ours." That is an important consideration. North and South Carolina peaches and other fruits go to the North before ours reach there, but competition in that State will not be so direct as to affect us materially. We have got to do something. Dr. Kimball wouldn't advise us to quit the fruit business and grow wheat and barley. It wouldn't do. Four or five years ago two gentlemen in my county came to me, that owned good land in this State—that was before there was any talk about canning fruits and drying—they said that they had been raising barley on land that was worth two hundred dollars an acre, and they were going to try fruit. Those men are now reaping the benefit of it. We must not grow wheat and barley; we must raise fruit. Mr. Davis told us one year ago, from this platform, that before one year the fruit-growing interest would be the greatest interest in the State, and we all shouted "Amen" to it. I think if we go slowly and take care of what we plant, and take care of our orchards, and then pursue the course that has been suggested of securing a reduction in railroad freights, then, beyond all doubt, we shall find a market for many years to come for all the fruit we grow.

I recollect, and some of you may remember, many years ago, when we had the Fruit Growers' Association, when one of the agents of one of the leading fruit drying establishments used to be there every meeting, and plead with us to go to drying fruit. He said: "Gentlemen, I tell you, you can grow plums and get rich at it, at one cent a pound." Well, of course, we laughed at it, and told him he might talk as he pleased, but we didn't understand it. Now, who doubts that the fruit growers can grow plums and do well at it? It is perfectly plain to anybody. Now, as Mr. Hickson said this morning, you can't get more than ten or twelve cents a pound for dried plums, but if you can buy them green, at one cent a pound, I suppose you can afford to sell them at ten or twelve cents. Now, I was going to say a

few words in regard to the railroad. It is known by those who have been there and investigated the subject that even New York City would consume ten times as much California fruit as they do, if they could get it at moderate prices. It costs as much to take grapes from California to New York as the grapes cost us at the high rate they sell for here now, say \$30 a ton. That is a consideration. We should use proper care in planting the right kind of trees, those that are adapted to the soil; planted under the proper conditions; avoiding planting trees where there is no probability of success, etc., and, taking it altogether, I cannot see that there is any ground for discouragement.

MR. AIKEN: I am going to take a hopeful view of this subject. I had thought but very little of it until Dr. Kimball read his essay on it. There is a cloud about as large as your hand appearing, and it is true that cloud may spread over the heavens, but let us enjoy God's sunlight while it shines. There is hope for California fruit prospects, I know, for in my connection with the Fruit Growers' Association, in statistics I have corresponded with the secretaries of eastern horticultural societies, and in answer to the question, "Will you take and pay for our fruit?" they all say, "Yes, send it to us; we will consume ten times the quantity of fruit you do send, if we can get it at reasonable prices; if freights can be placed at prices where we can buy your fruits, the whole eastern country will consume it." It is a fact that as much as ninety-three per cent of the products of the soil of the United States are consumed within the United States, and that only about seven per cent are now sold in foreign countries. Let manufactures increase, let business start up, and let a fair compensation and living prices be paid, and the whole one hundred per cent of our food products will be consumed in the United States. There is no doubt about that proposition.

California has a climate and it has a soil well adapted to fruit raising. That has been proved through many years of practical labor in fruit culture. This year our fruits bring good prices, we haven't got enough, we could sell ten times the fruit we have in this State if we had it; nobody complains of prices; we are complaining simply about some climatic troubles we had in the Spring that did not give us as good fruit, or the measure of fruit that we expected, but those who have it are receiving a reasonable compensation for their time and labor. In illustration I will refer to myself. I will say I had in one little plot an acre of French prunes. I sold a part of it at two and a half cents a pound on the ground, giving me \$250 for the acre net profit. One tree six years of age bore six hundred pounds of French prunes that brought me \$15. That is an illustration of what a tree standing in good soil without irrigation will bear. The prospect is good for good fruit planted in localities suitable to the kind we have. We will say in a mountain country we have a soil and a climate good for apples and pears; usually for plums and apricots, and, I think you will say, peaches. The fruit interest is in its infancy yet, and probably in the hereafter our fruit and wine product will far exceed any products of this State. I think the fruit growers should be content with a fair compensation for their labor and the capital invested, and make a living. It is not necessary to make \$250 a year from an acre as profit. We should all of us be content with a compensation, we will say of \$50 an acre. If a man should happen to have one hundred acres, and he should make \$50 an acre, he would have \$5,000.

That is all the money that he would have to live upon. Now we are all seeking a living. It is necessary for us to be struggling for a life in the fruit business. It is an honest business and we will endeavor to earn an honest living out of it, and if we get it we must be thankful for it, and the State will be prosperous. As it is divided up into small orchards, and those orchards supporting families with the common necessities of life, and some of the luxuries, and with the education and the privileges we enjoy. If we are seeking for that we will certainly find it; but if we are seeking to become a Flood or a Sharon, for instance, we won't find it, and we ought not to find it. The future of California is not in its mines. Indeed, it can hardly be said to be in its wheat fields, because the production is falling off. Years ago in Illinois the land would yield from forty to sixty bushels an acre, and now those men are content; they are living on eight to ten bushels to the acre and are satisfied. So it is with our California wheat fields. We cannot always expect the virgin soil to bear without manuring and enriching, and so it is they will go from wheat into fruit culture, and we will welcome them. If you please, there is room for all, and honest effort will be rewarded with a fair living. I look upon that subject in this way, and I believe that our prospects for building up homes and our orchards, and disposing of their fruits, are very bright—much brighter than in any other branch; much brighter than in wheat; much brighter than in wool and many other products; we should not complain. I don't see any clouds in the sky, so let us go forth with hope and gain strength in our work.

PROFESSOR DWINELLE: I have been very much inclined to take a conservative view of the profits of fruit growing. I believe the Chairman will remember that something like a year ago, when in the State Horticultural Society, some were inclined to take a gloomy view of this matter. I expressed myself as being somewhat discouraged as to buying land and planting trees, and said that I had about made up my mind to take up the Australian blue gum. Well, I felt then, with all that was said about the short labor supply, etc., that perhaps that was about the safest thing to plant. Within the next few months I looked pretty well into the questions involved. I traveled over the State considerably, as I wanted to find a place for a long time investment, with a moderate amount of money. I went to Los Angeles County and San Bernardino County, and concluded that with all the risks, chances of over-supply, short labor, and all that, I could not find anything, which, for a substantial solid investment, promised the income that fruit raising did. Consequently, I bought a moderate piece of land, forty acres altogether, and planted the most of it, and I want to know what the fruit growers really think. Dr. Kimball has suggested some things that had not occurred to all of us, and I should be glad to have him give us more definitely his figures. But still I do feel that with good judgment in buying lands, in a climate suited to the fruit to be raised, and discretion in the selection of varieties, and proper care of the trees, studying their characteristics, etc., that the fruit business still, with all the prospective diminution in price, promises better than anything else that is on a good substantial footing. Mr. Aiken has given us his actual experience with one acre of prunes, and I submit that that is an outrageous profit. It is perfectly unreasonable, anything like that, and I don't ask any such returns. We may any of us be struck by lightning, and, of course, we may have to take \$250, perhaps, on an acre

of prunes, but I say that any man that expects that, is almost as bad as a stock gambler. I say that \$50 net an acre is a good income on any orchard that is reasonably planted and raised. If some of our fruit growers are going to be disappointed by any such small income, all that they will have to do will be to sell their orchards, and try to find something better. And when they discover that about five or six per cent is all that they can reckon on, perhaps they will decide to stick to fruit.

Now we want to look abroad; we want to see what competition we are going to have. I am not a bit afraid of Mexico. Take the most expensive investment we have, orange trees. Orange trees cost something like ninety cents, instead of fifteen to twenty cents, for which we can buy some other kinds of trees. If Mexico is going to beat us I shall feel badly. I don't believe it. Mexico is going to take a long time to wake up and go into fruit raising as Americans do, and I doubt that any great part of Mexico can produce oranges like the best of California. I have been examining Mexican oranges, and have talked with some people that have traveled in Mexico. While some thought that some Mexican oranges were better than our best, the majority of them thought that most of the oranges were not fit to eat as compared with our good ones. Then we must consider the time of the year. I recall some facts that have been published under my authority, as to some experiments that I made in looking up the matter a little, as to what I should do with my oranges. I had a box packed at Riverside with a large variety of budded fruits and seedlings, and sent it to Colorado to a friend who is a judge of such things, and who I knew would give me his candid opinion, whatever the result was. He was very favorably disappointed in his estimate of the quality of those oranges, as compared with anything he had ever eaten. He has eaten the best from Florida and Cuba, and he thought the one I sent a very remarkable box of oranges. Beyond that, he told me that the best keeping oranges among them were those that I was most afraid of as shipping oranges, the Washington Navel, as grown at Riverside, being the best, the Mediterranean Sweet being good, so also the Malta Blood, and the usually praised Seedling orange was the worst, according to his estimation, for carrying. He said that dealers there objected to California oranges because of decay before they could sell them. Apparently the cheapest fruit in the market was what shippers usually sent. This was in Colorado. A few months before I had been there and seen what they called California oranges. They were perfectly disgraceful. They were the poorest type of coast oranges, covered with smut and scale bugs, and many of them were frosted. I was told by dealers that the poorest oranges they received were those that came from California. You could tell them by the "dust" on them, they said, evidently not knowing what scale bugs were. What my friend wrote me also showed that we could not compete with Florida, simply because our oranges don't ripen at the time of the year that they do in Florida. That crop is out of the way long before our oranges reach Colorado, and the Messinas are also earlier than ours. Now we want to know all these points, and I am glad to see that Dr. Kimball has called our attention to some of them. We must remember, too, that our own population is increasing, and the number of fruit eaters; also the population north of us in Oregon, and all up the Columbia River. I have no doubt they are planting trees, but I have seen many lamenta-

tions from the local press that their people were not up to the times in planting enough to supply their own wants. I have also had under my eye letters in the press, and in Matthew Cooke's hands, and one or two came to myself, asking what they could do there to save themselves from utter destruction from insect pests; and I got the impression that, on the whole, the people that used to compete with us are very likely to be taken out of the list of competitors because of insect pests, and particularly, the various forms of aphids that infest the leaves. As a traveling merchant told me, the trees looked as though a fire had swept through the orchards. Now I would like to have Dr. Kimball give us the basis of his figures and statements that we are likely to lose an outlet for our dried fruit and some kinds of fresh fruit in Oregon, and let us see whether we are actually overdoing the matter.

MORE ABOUT THE OUTLOOK.

MR. A. T. HATCH: I feel thankful to Dr. Kimball for bringing up this question and showing us what we may have to contend with in the future, and it is worthy of the common consideration of every fruit grower to examine the prospect they have in that light. At the same time I do not like to think of that cloud that Mr. Aiken speaks of while I am planting trees, for it may spread over the whole heavens. But I have always been told that every cloud had a silver lining, and I believe it, too. We may find the heavens full of clouds, and yet, if we elevate ourselves a little above those clouds, we may see that silver lining. Most people expect a golden lining set with precious stones; they may fail in the realization of their expectation. We have had that at times; we nearly have it now, when we are told of instances this year of sales of orchard products from \$100 to \$1,000 and \$1,500 an acre—even this year, which is called an off year. If it is a bad year, it still looks as though there are some precious stones in the lining of the cloud; and yet, it seems to me that we ought not to recognize that gold as gold or those settings as precious stones. They are fictions; they are things to delude us, and make us expect too much, as a rule.

When I first started planting trees, thirteen years ago, I based my expectations on a profit of one dollar per tree, which, making an allowance at the usual distance planted—for failures of trees by borers killing them, or from other causes, of about eight to the acre—would bring me about \$100 an acre. This would be a profit of ten per cent on \$1,000 an acre. Now I am planting on a basis of \$50 an acre, or 50 cents a tree, calculating that five per cent per annum net on the money invested is as good as ten per cent was thirteen years ago. If my land will produce me \$50 an acre on its worth of \$1,000 an acre to me, just so long as it will do that I am satisfied; and I think any man ought to be satisfied, taking one year with another, with five per cent on that valuation. Looking upon it in that light, I don't see anything to make those clouds very dark—not so dark but what we can see through them and see the silver lining on the other side. Nothing appears to me as good, of course in California, as fruit raising, or else I would go into something else. I am following it up the best I know how, and trying to get all the land I can, and trying to plant it all in trees as fast as I can, and I have used as much influence as possible to induce my friends to do likewise; and

I don't hesitate to say now, if it should come to pass, that our fruit should be valueless in San Francisco and we had no outlet anywhere for it; if hogs were worth five cents a pound and our orchards \$1,000 an acre in bearing, we could raise "scrofula" enough here for the world at five cents a pound. It looks to me as if the lining of the cloud is as bright to-day as it ever was.

OTHER VIEWS.

MR. CHAPIN: In listening to the remarks of the two gentlemen preceding me, Professor Dwinelle and Mr. Hatch, I am led to inquire in my mind how many orchards in this State to-day consist of even forty acres, let alone six hundred acres, that my friend Hatch possesses, and I can think of but very few. The most of the orchards are ten acres; and ten and twenty acres are large orchards. I think that my friend Dwinelle will find that by the time he carries that orchard on for six or eight years, that the dollars will look very large that he has expended in that enterprise; and he will begin to inquire whether \$50 an acre net profit is a very big thing for orchardists. I confess I don't want to work for any such small sum. I can't support my family on the profit that I can get on ten acres or twenty acres of land at \$50 net; and I would like to ask any gentleman here if they can take an orchard of ten or twenty acres, and support their family, and bring up their children as they want to bring them up, and educate them on a profit of \$50 an acre? It is well for us to consider, when we talk about reducing our profits to \$50 an acre, and advocating such views as that. I think we will find ourselves sorely mistaken in a few years; and I wouldn't advise it, for one.

MR. G. N. MILCO: I entertain the same views as Professor Dwinelle and Mr. Hatch in regard to this matter. I think it is a great deal better to get \$50 an acre, if we can, than \$10 an acre for wheat. This year I can show you farmers that are not getting one dollar an acre after paying all expenses; and they have got a big crop. They don't know what to do with it; they don't get one dollar an acre. I believe we can go to work as we please; we can raise much fruit or little fruit. The supply and demand will regulate the value of fruit, or anything we may raise. I don't care what it is, whether it is fruit or grain, it is the supply and demand that regulates all these things; but I do think that raising fruit at \$50 an acre is going to be a big thing in the future; because \$50 an acre is more than \$10 for wheat, or one dollar, that we are getting now.

MR. HATCH: I would like to say a few words more in regard to this matter of \$50 an acre in fruit raising. Now, a man may go to the most favorable or the best localities in the State, where there are lands for sale at the highest valuation, and we will suppose it will cost him from \$200 to \$250 an acre. That is a pretty high price to pay for land; but supposing it does cost \$250 an acre, the land, when it is brought to a state of bearing, will pay \$50 an acre, which I consider as good net interest. Of course you have got to get more than \$50 worth of fruit to make that profit; but \$50 net profit on an acre I count good interest; and I claim that that land, when it is brought to a condition when it will pay me 50 cents a tree, or \$50 an acre, has not cost me as much as \$1,000 in gold would.

CALIFORNIA AND ELSEWHERE.

PROF. HILGARD: The remarks of Dr. Kimball brought out one point which I think has been too far disregarded in the discussion we have had here, which is this: Californians have gone on planting fruit somewhat promiscuously. They have placed themselves in competition with other parts of the country. We all know that California is not likely to compete successfully with the East in fruits which the East can grow. Now, let us consider what other countries can do, and what the East can do in the way of raising fruits. Let us see where California differs from the rest of the United States and other fruit-producing countries. I think you will find that we need not be afraid of competition if we confine ourselves to raising that which we alone can grow. I took occasion, a short time ago, in a few remarks I made here, to mention the apricot: now, where does the apricot grow to perfection? Where do you find it brought into the market at all? Why, from a very limited portion of the East and Italy, and some parts of France and Greece. It is there that you get choice fruits for dessert in place of preserves. Now, let us see how the East can compare for apricots: In Illinois, in Michigan, and in New Jersey it is useless to plant the apricot, for where the peach succeeds, the apricot crop will be killed by the early frosts at least three years out of five, except in particularly good localities. Now, then, you set it down that the apricot of California has no competition except in some portions of Mexico and some parts of South America, and, like Mr. Shinn, I am not afraid of those competitors. What is it gives this peculiar advantage to California? Why, it is the climate, and the like of it exists only in a very limited portion of Europe. It is a dry climate; it has but little frost—in short, it is a Mediterranean climate. The fruit production of those foreign countries has lived upon the very low consumption, but that may be very greatly extended. When those countries begin to produce the amount of fruit that you produce, they will find home markets in Europe for the Mediterranean fruit. Fruit is such an expensive luxury in all European countries at this time, that only the wealthy are able to use it.

I have lately inquired, with some diligence, with reference to the consumption of fruit in the southern part of this continent, and I found, to my astonishment, that those countries that we looked upon with envy as producing the choicest fruits of the tropics, were not fruit producers at present, and were not fruit consumers at the present time. They live as our backwoodsmen do—on pork and beans and corn. I don't think this will change very rapidly, but at any rate, when they begin to produce fruit they will eat it at home first. Now, this is a Mediterranean climate; this is a dry country, where there are no late Spring frosts as a rule; this is a peculiar climate that we have, and it gives us the advantage that we can have the choicest of all fruits. You well know, for instance, that in the Eastern States, away from the Gulf coast, the European vine is not grown. We are told that American grapes make as good wine as any. Well, I will tell you; the world's markets are not used to the wines made of American stock. California has the exceptional privilege on this continent of being able to grow the European vine. Why? Because of the absence of extremely low temperature. It is not the phylloxera alone that killed the vine in the East, but the

Winter frosts mainly. Every four or five years, at least, severe frost extends as far south as the Gulf coast. South of Ohio it might not be killed by Winter frosts, but it would still be prevented from being fruitful. North of Ohio the American grape frequently suffers in Winter, and it is certain that no European vine will succeed there.

Now, as regards the fruits which the East can readily produce, we still have the choice of each varieties as reach their greatest perfection only in this climate, particularly the almond and olive and even of such as plums and pears. Speaking of plums, the prune can be grown in the East, in a few favorable localities only, such as sheltered nooks in the Alleghany range, and few plums reach perfection anywhere in the East on account of the inroads of the curculio. And though the curculio may be imported into California, as was the codlin moth, we need not fear eastern competition in that respect. Let us see about the peach. Peaches are successfully grown in a large portion of the East for home consumption, yet there are only a few regions from which the peach is regularly marketed on a large scale, such as western Michigan, New Jersey, and the eastern shore of Maryland. While I resided in the Southern States, I discovered that there was but little profit in peach growing when the peach grows like it does in the cotton States. Every old roadside and hillside will support the peach tree. It is perfectly wonderful how they grow and what good peaches are produced, and on the lands which are good for nothing else you can produce peaches by the hundred—seedlings, which the negro, I will say, and some of the whites, scatter broadcast for the fruit. They actually grow wild. But when you consider the question of profits it is quite another thing. In 1870, I think it was, the Convention of Fruit Growers in Memphis, after a long discussion, unanimously resolved that in that section of the country the peach could not be recommended as a profitable crop for the market because of the late Spring frosts, which too often either totally destroy, or at least injure the fruit. I can speak from my own experience, for, in ten years, during which I fruited a dozen varieties of peaches in northern Mississippi, I never saw more than half of them in any single year, and the early Crawford only once during the whole time. In view of these facts, I think we need not fear competition from more than two points, the eastern shore of Lake Michigan and the Atlantic Coast from New Jersey to Chesapeake Bay.

Now, therefore, if we take particular pains to confine ourselves to those fruits and those varieties of fruits in which California has the advantage of climate, I don't think that the element of competition will alarm us very much. But if we go into the cultivation of those fruits that the East can cultivate as well as we can, why, we will place ourselves at a great disadvantage. In other words, we don't want to "ship coals to Newcastle." I think the California pears have acquired such a reputation that if we would carefully ship those pears only which are especially adapted to the climate, we shall have a good market for our pears. It is not easy to find pears that will compare with ours. It is the same old story there of Spring frosts and the bug, which destroys them. On the whole, taking all these facts into consideration, if we are careful and utilize all the advantages that we possess, we need have no fears for our future for a long time to come.

THE APPLE AND OTHER FRUITS.

MR. AIKEN: Those that have traveled in Europe say that they cannot find anywhere there, an apple that will compare with those that we have here. I have observed that at no time in ten years have good Newtown pippin apples brought less than, we will say, \$2 a box. Now, although we may not be able to raise as good an apple as in the East, we can raise good apples in California and get a good price for them; I brought some of the Jonathan down here; from them I made over \$2 a box. There is certainly money in apples at fifty cents a box, and I would like to ask Dr. Chapin, who said \$50 was not enough profit on an acre, what he can take his twenty acres and put it into that he can get \$50 for, except fruit or grapes.

DR. CHAPIN: I think if the matter was reduced down to that point, attempting to live off the profits of twenty acres, that I would have to hunt some other business. As for the Jonathan apple, I will use it to illustrate our peculiar conditions. In many localities that apple is not worth really the ground it requires to grow the tree upon. It is not a safe proposition to plant that apple. In many localities it may do well, as in the Santa Cruz Mountains, but I can point to a thousand localities in this State where it would be a perfect failure and the ground planted with it would be an utter loss; so we must be extremely careful where we plant our fruits. That is one of the most important elements in this fruit industry, and that knowledge has to be acquired by many years of local experimentation. I consider that those years of time and money expended in acquiring this information has a great deal to do with the question of profit. Carrying on those experiments for six or eight years to ascertain what varieties of fruit will do well on a certain piece of land, and then having to replant that orchard and wait another five or six years before you can get any return—it occurs to me as though we needed a pretty reasonable profit to stand all that.

MR. DELONG: I don't see that we will be compelled to take \$50 an acre for our fruit for long years to come. Take, for instance, apricots. Now give a man twenty acres of apricots, set out as the ground will bear. I am safe in saying that twenty acres will carry two thousand five hundred trees; but take it on the basis of two thousand trees, if they bear two hundred pounds to the tree, which is not uncommon for trees four or five years old, at the present prices we have been receiving—of course the price is enormous, if we take California prices right along. But take two hundred pounds to the tree, at one and one half cents to the pound, it would be \$2 50 to the tree. Cannors admit if we can furnish them good first class apricots at one and one half cents per pound, they can use twenty times the amount they do. But, to be safe, put the yield at one hundred pounds to the tree, at one and one half cents to the pound is \$1 50 to the tree, or \$150 to the acre. No man can claim that it is at all probable that the expense on that would be \$50 an acre; but, if it was, it would net us \$100 an acre anyway. Cannors concede this point: When fruit reaches anything like one and one half cents per pound, there will not be cans enough to can the fruit. Taking it on the basis of one and one half cents per pound, and it dries at five pounds to one, it would cost on an average of seven cents to produce a pound of dried apricots. If we sell at eight cents, we would still get \$100 an acre.

Take Bartlett pears; if you put them twenty feet apart, which is somewhere near one hundred to the acre, two boxes to the tree is not large after the tree is eight years old; and on the basis of \$1 a box, the yield will be \$2 to the tree. The expense is not heavy at all in gathering the pears. Some days (but that is an exceptional thing), I have seen men pick sixteen boxes of Bartlett pears this year. Now, if a man can only get half a dollar a box, the profits then wouldn't fall below \$50 to the acre, and that is a much lower price than we are getting. Now I think we might as well make up our minds to take such profits, as they are still better than anything else we can go into.

MR. GRAY: On Rancho Chico we have raised about everything that can be raised in this State. We have about one thousand four hundred acres of orchard, and I claim that we have made this year, and for the last four years, more profit out of the orchard than we could possibly make out of any other investment. We had this year one cherry tree from which we took one thousand seven hundred pounds of fruit. This, at five cents a pound, at which we sold to the canner, would make it rising \$5,500 to the acre. Of course we don't expect to do that again for long years to come. I think there is one way out of the difficulty of getting more than \$50 an acre, which is, as soon as we can get the railroad to reduce freights, so that we can get our fruit to the East, we can ship all we can supply. I know their orchards at the East are diminishing every year, and have been ever since I can remember. I know where we used to raise the very best of fruits, they now grow smaller and are of poorer quality. And the qualities of the soil which enabled it to produce good fruit are gone, and it can never be restored. You wouldn't think you were upon the same land.

MR. DELONG: I think apples will be a good thing in a few years. Some years I have been obliged to sell them at an extremely low price, but as a general rule apples bring good prices. Here is a good market for Australia. There were over seven thousand seven hundred boxes sent on the last steamer, and six thousand four hundred boxes sent on the steamer before that, and probably there will be ten thousand on the next. Now, I was offered this year for eight thousand boxes for Australia, \$1 50 a box, delivered on board, and I think when a man can get \$1 50 or \$1 45 a box for good apples he is doing very well.

MR. CHAPIN: I would like to inquire of Mr. DeLong what proportion he has had of good apples in his orchard this season, and how it is around Petaluma and in Sonoma and Marin Counties.

MR. DELONG: In answer to that I will say that we have what is called an off year and an on year. One year they bear extremely heavy, and the next year they bear what we call a one third crop. Everything else is better then, but we are enabled to get better prices by holding them over for Winter. Fortunately for us the on year comes when everything else is in the off year. This year we have got a very poor crop, and everything else is better, but next year we expect to have our year and a large crop. I sold in the City of San Francisco, last year, over seventeen thousand boxes of apples, and we made from the surplus apples and wormy apples over twenty-five hundred barrels of vinegar, and, with the cider, it brought us about \$6,000. Of course, a man going into the apple business, or the fruit business, must realize on all the product. If he cannot sell all the

fruit, he has got to put it into something that he can sell. But good apples in this market, from now on, I can safely say, will bring all the way from \$1 to \$3 a box. Of course I don't include worms; we have got to bring good apples. The greatest injury inflicted on the apples on our place now is by the codlin moth, although I see apples full of worms selling here all the way from 45 cents to \$1 a box. If the people that consume apples will simply say they won't have worms, the men that own the orchards will have to produce better fruit; but a good many come to the conclusion that they can sell their fruit, worms and all, and all the worms count.

LOCAL CLIMATES.

PROF. HILGARD: There was one point that Dr. Chapin mentioned, which I think is of very great importance, that is, this matter of local climate. Dr. Chapin mentioned that a man might plant a particular kind of fruit in a certain locality, and after the lapse of seven or eight years find that he was in the wrong place to grow that kind of fruit. Now, I think that is a point that should be carefully observed, as the consideration of the climatic peculiarities of California is a paramount one as regards competition. In this State we still have a great deal to learn about these peculiarities, and we should study closely the local adaptations of each section. The farmers and fruit growers both ought to be more aware of the importance of knowing their local climate. They should have the rain gauge, the thermometer and barometer more common as household implements, and so define more closely the thermal belts. I received today a proposition from a gentleman in Oakland for the establishment of weather stations throughout the State, or a part of the State, with the aid of the United States Signal Office. I think it is an excellent idea, and I should be very glad if this matter should be brought about before this convention adjourns, and that some plan be adopted for the purpose of general observation throughout the State, to ascertain the climatic peculiarities and local adaptations of each section of the State.

FIFTY DOLLARS PER ACRE NOT ENOUGH.

JUDGE BLACKWOOD: The idea has been advanced here that we ought to do very well selling our fruits at a profit of \$50 to the acre. Perhaps a person having a very large orchard could make a living at that rate, but as Dr. Chapin has said, the bulk of the orchards are small, generally of ten or fifteen acres, and it would be impossible for a person with a family, having such a small orchard and depending upon it to educate his family, clothe them, and make them comfortable and respectable in society, to exist upon a profit of \$50 an acre on his land. Now, one consequence of this \$50 profit will be this: that men that have two hundred acres or five hundred acres of orchard and can make a profit at \$50 an acre, they will buy up all the little orchards and thus create a big monopoly. That is one of the consequences growing out of this cheap orchard production, but that is not all. As Dr. Kimball set forth in his paper read this afternoon, there is the danger in other markets for our fruits; that we will have to face competition all through the fruit-growing districts of the United States. I have gone through several little crisis in my California experience of twenty-

seven years, in which I have gained some valuable knowledge. I want to tell you about a little experience I had in 1853, with a number of others, when we were squatters. We squatters were engaged through the Winter in plowing and fixing our ground for raising potatoes, from which we expected to get very large returns. Along in the Spring we began to count our chickens before they were hatched. This man was going to plant so many acres and that man was going to plant so many acres; they would probably fill so many sacks to the acre; it would cost so much for digging, and taking it altogether, in our estimation we couldn't get less than \$3 per sack, and we would all get rich, and we went to bed in our mountain couches and dreamt happy dreams on the prospect. Now, about the result: we planted our potatoes; we made the number of sacks that we expected to; the cost didn't exceed what we expected, but what about the cost of these sacks? For all I know the applications for sacking are sticking up there on the ranch yet. The crop couldn't be sold for more than expenses. Now, what may be the result to many of you men that think you cannot stand \$50 an acre? You may not be able to get fifty cents an acre for your fruit. Now, for instance, in Haywards a few years ago there were a good many making money in currants. I was making a little, and the idea got out that there was an enormous profit in currants. Along in the Fall of the year they would come to me and say: "Blackwood, can you let me have a few currant bushes?" Then another would come and want so many dozen, and another would come and want so many dozen, and so all the currant cuttings of our little orchards were sold to the neighbors. I began to say to them: "Look here, aren't you going a little fast in this currant business? They will all come to bear in about three or four years, and I question that you can sell them." "No," they said, "the canners will take all the trade won't take; they will take all that we bring." This year there were a few sold at \$5 a chest, and they sold down to \$1 50; and one quarter of the Hayward currant crop is on the bushes to-day. Many of the men that went into it then, and one of them whom I have particular reference to, told me that he hadn't got enough out of his currants to pay for the chests he bought. Now, there is danger in over production in fruits. We must look at it cautiously and carefully, and consider if we can sell sufficient to carry us over the time when this plethora of fruits will take place. There are a good many orchards that are planted on low ground. Some have planted, so to speak, by the wayside, and a few have planted on good ground, where, if they wait and be patient, the time will come when it will yield thirty, fifty, and one hundredfold. But the time will come, too, when it will try the patience and the pockets of the fruit growers; and that will be in the near future.

MR. COATES: Currants should be banished from the fruits of California, in fruit raising. Professor Hilgard mentioned that there were certain fruits that are well suited to this climate; now, the currant can be produced anywhere. It seems to me that that cannot be considered as a product of California. I don't think there is hardly any place that it cannot be raised; and while it is a peculiarity of California that we can raise fruits here to perfection that cannot be raised in the East, those small fruits in this country are not as profitable, because they can't be dried to any advantage, and they can be raised in the East as well as they can here.

MR. BLACKWOOD: Probably I didn't make myself understood. I merely referred to the growth of currants last year as an example of the danger of over-production of fruits. I never have known of any one growing currants here for shipment to the eastern market, but I was simply making that illustration for the purpose of showing the danger of over-production of fruit, and that you will not be able to sell it at a profit of \$50 an acre.

THE APPLE AGAIN.

MR. SHINN: I want to say one word about the apple. You probably understood Professor Hilgard to speak unfavorably of the growth of the apple on this coast. I think he claimed also that it wouldn't be a suitable fruit to grow for exportation. Now, I don't think that we ought to be discouraged about planting the apple, for I know of nothing that holds out a better prospect to the fruit grower than the apple. Why? Because the old apple orchards of California and Oregon are going to waste; they are worn out; they never were good apple trees; they were not the right varieties that were planted twenty or thirty years ago. Among the fruit growers for the San Francisco market, I haven't found one that was disposed to plant apples. Now that is something that we should take advantage of, and I feel like encouraging every one that has a good place for the growth of apples—and there are plenty of them—to plant them; for I think that you couldn't do better than to plant apple trees, and the best quality, for the San Francisco market. And you need not go beyond San Francisco for the next twenty years. Don't be afraid to plant apple trees on this coast—not with a view of exporting to the East, but for home consumption.

PROFESSOR HILGARD: I referred to growing fruits for export, and not for home consumption. I am personally aware of the fact that Oregon is exceedingly discouraged about apple growing, for more than one reason; not only the codlin moth, but several other reasons. Probably we will find purchasers for some of our apple crop in Oregon, but sending them to the East is what I designated as sending coals to Newcastle. I was considerably surprised when I heard Mr. DeLong speak of exporting apples to Australia, because I supposed that Australia produced good apples.

MR. DELONG: In answer to that I will simply say, that the way I understand that country down there, our August is the same as their December, and that it is their Winter there now, and after the next steamer their own product comes in; then we will simply supply the demand that that month calls for when they are out of apples, and it rids this market, if the steamer goes all right, of thirty or forty thousand boxes of fruit. Of course, there is many an apple shipped to Australia that never ought to be shipped there. There are but few varieties, according to my idea, that it is safe to send. The yellow Newtown pippin is the best apple that grows for shipping; the Red-cheeked pippin is a good shipper; the Spitzenberghs that will ship are a splendid shipping apple; the Smith Cider will ship well; the Wine Sap, also, is a good shipper; the No. 2 White Winter Pearmain, if picked while just so green that it will not wilt, will probably ship well; the Swaar will ship well if it is picked a little green—that is, just when the seeds commence to turn black; the Northern Spy is a good

shipper if picked a little green, but after it has ripened up it will not do to ship it; the Jonathan is a good apple to ship; the Roxbury russet, if it can be picked just so green that it will not wilt—if it can be shipped immediately—it is all right, but if you have got to keep it it won't do to ship—it must be shipped immediately; the Gravenstein will not ship—they are a poor carrier; the Summer Pearmain will not ship; I would not advise the shipping of the No. 1 White Winter Pearmain, as the probabilities are that they will turn mealy when they ripen.

On motion, adjourned until half-past seven o'clock Tuesday evening.

REPORT OF COMMISSIONER MILCO.

The session on Tuesday evening (Dr. S. F. Chapin in the chair) was opened with a report by G. N. Milco, Commissioner for the San Joaquin District. His report may be found on page 56.

DISCUSSION ON REPORT OF COMMISSIONER MILCO.

THE CHAIRMAN: I would like to ask Commissioner Milco, if in dipping the fig in hot sea water, it is dried at all afterwards, or immediately packed after the dipping in the moisture?

MR. MILCO: In less than two minutes, or almost instantly I might say, as soon as you dip the figs in boiling water and turn them over on to a tray that's used for drying, the fig is perfectly dry and ready to use. It dries on the instant—clean and dry, so that it is always left in good condition.

MR. WHEELER: I'd like to ask Mr. Milco as to the temperature, whether the water should be boiling?

MR. MILCO: That is the only way I have seen this thing done in my own country, but as to the temperature, I couldn't positively say exactly what that should be. We had a receptacle made to hold the figs, and let it go down into the hot water and hold it about two seconds; then take it right out, dump it right off, and spread them out on a tray.

MR. GRAY: What would you do for sea water away up in the country?

MR. MILCO: It is no more difficult to get some sea water down here than it is to get a barrellful of old whisky. A barrel of water will do a good deal, and it costs but very little.

MR. GRAY: The idea was, do they make sea water artificially?

MR. MILCO: I should think that putting salt in water would do; but I would rather take my chances on something that I know is good. If you go to any of the wholesale houses here—and I have taken particular steps to go into some of them—and examine some of their figs that are imported; if you lift up a fig or two, you will find underneath lots of worms. Now, my object in making the statement I did in my paper, that we should pack our fruit in cans, and have them hermetically sealed, is to prevent any contact of insects afterwards with the fruit until it is ready to eat. In the first place, by dipping in the boiling sea-water, we expect to kill all the germs of any insects that may be in them; after that, we seal them hermetically, and we are perfectly safe of any insects after that. But, I am of opinion that figs, brought here in kegs and boxes as we have them, are liable to be approached by insects, and the air is liable to

get to them much easier than it would in a hermetically sealed can. That is the way we put them up at home, and they kept good for years, just as you get the dates or anything of the sort perfectly free from insects.

MR. HATCH: I would like to ask, if you used fresh water (hot), would it do?

MR. MILCO: I cannot tell you anything about fresh water (hot); I am talking about salt water. It must be sea-water.

MR. HATCH: Another thing I would like to ask you, because I read it in the paper some time ago. According to that article, they bring figs from Europe to New York in bags, do they not, mostly?

MR. MILCO: They bring some of them in barrels, while others are packed in cans, and others in sacks.

MR. HATCH: The reason I refer to it is, the same article speaks about a worm that's native to the country where they are raised, and there is an orifice in the fig where the egg is laid in, and the worm perfects itself on the voyage; and the ships that bring the figs to the country are literally covered inside with the worms. But, the fruit is not considered to be hermetically sealed. They go out and pick the fruit, and pack them into these little bags we get here. Now, I would like to know about dipping the fruit in lye. I found it very beneficial. I never heard of salt water.

DIPPING IN LYE.

MR. GRAY: I will tell how we have been doing in Chico, for the last four or five years. The figs are entirely different from those we have presented here. I don't know as we can dip a white fig in a weak lye without spoiling the color; I think it would be doubtful, if done. But, with the common California black fig, we have been in the habit of dipping them in lye—a pound of concentrated lye to two gallons of water—and it gives them a good color; they look much better. Of course it should be hot when they are dipped. I don't know whether you ever tried it with the white figs.

MR. HATCH: Do you rinse them?

MR. GRAY: No; dip them in. The lye is so weak; I have eaten them half an hour afterwards.

WHERE DO FIGS SUCCEED?

MR. MILCO: I would like to know how the figs will do in different parts of the State; I don't speak of this particular kind; but I know if that particular kind will grow, all kinds will grow. I know very well some particular places where some particular figs are not growing as well as others. I know it is a tree that requires less attention than others. The less you cultivate the tree, the better the fig is. I find, if you plant a fig, you want to let it alone. You don't want to be plowing about the roots or anything of that sort. I would like to know about the localities.

MR. GRAY: Mr. Chairman, at Chico, we have not succeeded very well with anything besides the common California black fig, and the trees there are large, and they give good returns of fruit—two large crops every year. They have not failed yet. We have several kinds; one (I don't know the name of it), sets its fruit along just about this time; the first crop sets about now; and, if it could be protected, we

would have figs all through the Winter clear to Spring. Last year only about half a dozen ripened. The black fig is a very good fig, but they seem inclined to set very late, and, in spite of the cold weather, keep setting all through until the tree is perfectly covered with small figs; but, owing to the cold weather, they do not mature. We have four or five kinds of white figs. Well, two of them don't amount to anything; they set and get about half grown and then blast and drop off—that seems to be the nature of them. Some trees of early fig—or supposed to be—some years are very good, and other years are hollow and pithy—nothing like nor as good as the fig presented here. We have in the nursery quite a number of what is called the “new white fig.” There may be some here who know more about it than I do. We got the “new white fig,” I think, from Mr. Williamson, of Strong & Co.

THE CHAIRMAN: How about the white fig?

MR. GRAY: I don't know about that. I know we have it in the nursery. They are recommended as being away ahead of anything raised yet.

THE “PACIFIC WHITE” FIG.

MR. WHITE: The gentleman upon whose place the fig originated, got his cuttings from some trees I have got, and he named them the “Pacific White.” They are a very fine white fig. The only objection is the thickness of the skin. Mr. Milco has something similar to them.

MR. MILCO: And quite fleshy inside like this (showing).

MR. WHITE: Yes, I think it looks very similar.

MR. GRAY: We have one similar fig—I never saw anything as large as this one here—they have a very thick skin, so I think that you cannot do anything with it.

MR. MILCO: That is the Ischia.

THE CHAIRMAN: A few weeks ago I was at Mr. White's farm, at Penryn, and ate a fig there from the tree, and it is most delicious, but still that fig is not as desirable a one as Mr. Milco's, on account of its thick skin.

MR. WHITE: As far as sweetness is concerned, it is, I think, as good. I don't know as it is as large.

THE CHAIRMAN: They are entirely different figs.

MR. BIGELOW: I would like to inquire of Mr. White if his fig was a seedling?

MR. WHITE: I don't know. Mr. Williamson said he has not seen anything similar anywhere else in the State. He took a fancy to them himself, and named them the “Pacific White.” They were plenty on that place several years ago—probably ten or twelve years ago.

THE CHAIRMAN: Mr. Blanchard must have planted those trees.

MR. BIGELOW: Dr. Miller, in 1863, had very fine trees, similar. The fruit used to dry and drop off the tree. I never knew the name of them. I don't know but they might be the same fig. In 1863 he imported them from Europe.

THE CHAIRMAN: That is the locality where the fig grew most excellent.

MR. MILCO: I would like to ask Mr. White how long ago it is since he discovered this fig on his place, or did he buy it?

MR. WHITE: I bought the place, and the fig was already set out when I got it.

MR. MILCO: How old was the tree?

MR. WHITE: I should judge it was several years old. I couldn't tell. I guess it was planted about ten or fifteen years, probably.

MR. MILCO: I want to tell the truth about what I know about this fig. About eleven years ago I imported some figs of this species and the San Pedro. The San Pedro I haven't got here. It is a fig that only produces the first crop. It is an enormously large fig. It is a table fig that doesn't dry. I had some of these two varieties—they came from Dalmatia about eleven years ago—and I sold the trees after they were rooted. And, about the time the stock was reduced down probably to fifty or sixty trees, Mr. William West, who was then engaged very extensively in the nursery business at Stockton, came along and wanted to know how many trees I had left. I counted them all up. They were small—some of them about a foot long, and some of them maybe eight or ten inches. He said, "What are you going to do with them? I'll take the lot; what will you take for them?" I said, "I don't know; I'll take a dollar and a half apiece for them." He said, "I'll give you a dollar and forty cents apiece for them, and I'll take the lot." "All right." Mr. West had been propagating this fig for years, and, I think, once or twice during that time, he came to my farm and brought figs of that kind. But I never saw one of the San Pedro grown by him, because it will take some time before the San Pedro will produce fruit. This fig I have been showing you this evening never made its appearance in this country until I imported it lately. But what I want to say in regard to this particular fig you speak of (Mr. White's) is: You will find it scattered now almost every place over the State; you will find a tree here and a tree there. There are probably a dozen places in Stockton where you will see trees of that kind, where the people don't seem to know what kind it is, and don't pay much attention to it. You know when people go to the nursery and want a couple of peach or a couple of apple trees, or pear trees, or fig trees, they stick them up in the lots in town, and don't pay any more attention to them; and that is probably the way those trees have been scattered about. Mr. West has been out of the nursery business two or three years. He told me last year that he had seen a great many of these figs scattered over the State and Southern California. This fig that I have been showing to you, in the dried and green state, I have named the "White Dalmatia." I don't know whether I am coming in conflict with the "Pacific White."

THE CHAIRMAN: One is the "Adriatic."

MR. MILCO: The best one is the "White Adriatic," and the other is the "White Dalmatia."

MR. WHITE: Both of these only produce one crop.

MR. MILCO: Only one crop.

MR. WHITE: This I speak of has two crops. One is rather light, but the second one is a heavy crop.

MR. MILCO: Then it is different, because neither of these have but one crop.

MR. WHITE: The first one don't amount to anything, but the second crop is very heavy. These trees I have reference to, some are perhaps a foot in diameter, large trees, very prolific bearers. Do you know if sea-water scalding would thin that skin (showing)—make

that skin any thinner, to dip them, as you spoke about, in boiling sea water?

MR. MILCO: I think the sea water has a tendency to make the figs soft. It has no effect on the taste of the fruit. It would not be tough at all; it would make the skin perfectly soft and nice—almost as soft as cotton—a great deal softer than the fig is now. These figs (showing) are just as they were taken off the tree. These were taken off yesterday, and the others on Saturday.

MR. WHEELER: Mr. Milco has stated that he never tried the experiment with fresh hot water. Would it not be advisable for him to have the figs, before they are dried, packed both ways? It would not be a very difficult matter.

MR. MILCO: I think it would be a very good idea.

HOT WATER OR SALT WATER.

MR. WHEELER: I have had some experience in thinning the skin off. The hotter the water is, the quicker it dries—no break—and I think it will have the same effect on the skin as dipping the figs in sea water. The water should have a temperature of as near boiling heat as possible. I think the object of dipping is probably to kill the worm, if we can judge by the texture of the skin of the fruit you have here, because I understand they have not been dipped in salt water.

MR. MILCO: No, sir; they are just as they came off the trees.

MR. WHEELER: And it would have no impression on the skin, even if you did dip them in salt water?

MR. MILCO: Yes; I think the fruit would become sort of leathery then.

MR. WHEELER: It may, from the chemical properties the water would throw off.

MR. MILCO: That seems to be the old fashioned way of doing it in the old country. We may have some better way of doing it in this country.

MR. WHEELER: I think it is worth while to try the experiment both ways and let us know next year.

CAUTION IN PLANTING.

MR. MILCO: My object in showing these figs in the state they are, was simply for this purpose. As nurserymen, we very often have something very new; and the fruit growers particularly have arrived at a certain stage when they must be very careful what they are planting. Now, my advice to every man that is going to plant any trees, is, to look a hundred times around him and take advice from those who have had experience in the business, and to always look out, first, what he is planting; because when he once takes a tree and plants it, he has to wait two or three years before he can see the result. And, I think, in the future, we should go to work and take advice from the experienced men, and also find out the best fruit to be grown, and, if possible, to see the fruit itself and be satisfied.

Now, I certainly, for the last twenty years, have read articles from time to time on fig culture and other culture; and oftentimes see in the papers that the man that will bring the best fig and the best olive will made the most money. If we are going to bring anything of

this kind, let us show these things to the people and let them see they are going to have something worth having; and, if it is not worth having, let them put their foot on it and discard it. But this thing of pushing a thing we don't know, I don't believe in it. The time has come when we must choose what we are going to plant, and we cannot raise anything and everything and make it pay.

THE CHAIRMAN: Gentlemen, it has been observed in regard to other fruits, and it is eminently true of the fig as well, that the question of locality is a very important one to consider in the question of planting figs. There are very many choice localities in this State where the fig can be grown to perfection. I see no reason why a right variety of figs may not be as well cured and sent into the market, under as favorable conditions and in as good shape as any imported specimens that we can find. I certainly think that we have better figs here in California, put up in better shape and more delicious to the taste than any imported figs that I have eaten for many years. And I can say of this fig particularly, the "White Adriatic," which Mr. Milco has presented here to-day, that it is one of the very choicest of figs. And another one, which is a very choice one indeed in the locality where it is cured, is the "White Ischia," a small white fig raised at Riverside.

Mr. D. A. Burnham has put up that fig, and sent a few samples of it to market. He has a few trees, probably three hundred, and has cured that fig and made a most delicious fig out of it. And also this fig that has been mentioned by Mr. White—the "Pacific White"—is a very delicious fig, except the thickness of the skin, and I think that by experiments in curing, that may possibly be overcome so that it may not be an objection. We are learning all the time new facts in regard to the preparation of our fruit products, and it will gradually come about so that we shall be able to present in the most marketable shape the various fruits which we can grow most successfully here in California. We have not as yet arrived at perfection in the preparation of our fruits; that is, very many of them, although some of them are probably as fine as they can be prepared, but we will make progress in them, and many fruits that are hardly known now will some day be received with great favor in the market.

The fig is an important fruit for us to give attention to; and, in the localities where it will succeed, it will be a profitable fruit to plant. I believe there is no fruit tree, as Mr. Milco says, that will so well repay care and attention as the fig. We know how it is with many of the orchard trees, unless they receive the most careful attention and nursing, which we can dispense with with the fig, but which, if not given to these varieties of fruit trees, would result in their destruction. With the fig, you can leave it almost to itself. And, though that be the case, of course it must make a vast difference in the case in which an orchard of figs is taken care of. We all know the amount of fruit which fig trees are capable of bearing, and it is most astonishing. A ton to the tree is a frequent amount. That, I have heard mentioned as coming from single trees, in many instances and in many localities in this State. There are gentlemen here from Healdsburg, one of whom mentioned to me that he had a fig tree upon which was hanging a ton of figs to-day. But, unfortunately, the varieties which bear most enormously are not the ones from which the greatest profit can be secured. We want to pay attention to those which are most marketable, and ascertain where

they can be found to thrive best. I anticipate a very favorable outcome for the fig culture.

MR. PROVINES: I have not had much experience in it. I have two trees, and I think either of them will bear a ton of figs. There is a great many on them now. Of course they are not ripe; and I would like very much to get a better variety.

MR. MILCO: I'll state, Mr. President, that the "White Adriatic" fig tree is one of the most prolific bearers I ever saw. They just hang full from top to bottom.

THE CHAIRMAN: One crop?

MR. MILCO: One crop—a late one.

MR. PROVINES: I would like to ask Mr. Milco which one he is referring to.

MR. MILCO: The "White Adriatic"—the best fig we have here. And I will state further that this fig is just as fine an article for drying as it is when fresh; that is we can send it to the market for eating purposes, for table purposes, as much as it would be a fine article to dry. I think that in both shapes it should demand a high figure in the market, because it is very delicate and of a delicious flavor. I will further state that I am now trying very hard to arrange so that from the beginning of July to the first of January we shall have a continuation of white figs—no more black figs, such as we have here, but a different variety. That is the only kind of fig I can offer to the public now for examination as the best white dried fig. But, as far as the eating figs, in the course of a year or two more we shall be able to offer samples of figs that will keep on ripening, one after another, from the first of July to the beginning of January. When all fruit, except apples, are out of market, this last Winter fig, as we call them, will be in full bearing, as fine as this now.

THE CHAIRMAN: I might mention now, if there is any gentleman who is looking for very excellent and most choice land upon which to plant an orchard, one locality which I consider as extraordinarily choice, and that is on the western side of the Sacramento River, a little below Tehama, in a valley running up to the mountains, on what is called Thomas Creek. There is a valley there in which the choicest figs grow. Taking a limb from the fig tree and sticking in the ground any way is about all the attention that is ever required; without any cultivation it will grow in spite of the neglect. There are not many of those localities to be found in the State, and it is well for those particularly looking for good localities to study up the locations in which the fig grows best.

MR. WHITE: I will state, for the benefit of the convention, that this "Pacific White" I am speaking of will do just the same up in the foothills. And I will state, all through the foothills, from five hundred to one thousand feet elevation, they seem to do remarkably well, and to grow without any cultivation. As Mr. Milco says, they seem to do better with least cultivation—scarcely any water. I have trees growing now a foot in diameter. The soil is largely composed of granite.

MR. MILCO: I remember a couple of years ago, Dr. Chapin and myself were on the Merced River, and we saw some large fig trees up there. I don't think I have seen anything larger in the old country where the trees have been standing perhaps a hundred years.

THE CHAIRMAN: That is the point where the very finest fig trees grow. We saw three trees—I have forgotten the dimensions, but I

remember in particular, of one or two trees that were near together there—several of them—and any of those, the owner of the orchard told us, produced a ton of figs a year. The trees were immense in size, and growing with the greatest vigor. And the only other orchard crop grown there, besides the fig, was the hog crop referred to this afternoon by Mr. Hatch. That was all the use made of the fig—feeding hogs.

MR. GRAY: There is a gentleman from Red Bluff, I think, I saw a week ago looking for trees. He was going to set out seven miles on a creek that runs through his pasture, on his ranch.

MR. COATES: The figs are not a success at all in Napa Valley. There are only one or two varieties which we can grow there on the hills. The common black fig can grow very well—late maturing. One variety of white fig bears very well and matures two crops every year; a very small white fig, flat in shape. That is the only variety of fig I know of.

The convention then adjourned until nine o'clock A. M. Wednesday.

WEDNESDAY MORNING'S SESSION.

The convention assembled at half-past ten o'clock A. M.

MR. R. J. TRUMBULL remarked that the attendance was smaller than it should be, and moved that a standing committee of five be appointed to coöperate with the State Board of Horticulture in preparation for and in extending invitations to the next annual session; to appoint essayists and select subjects for discussion; also to have power to devise ways and means for meeting the expenses of the convention. The motion was carried, and the Chair appointed the following committee: R. J. Trumbull, of San Francisco; J. V. Webster, of Fruit Vale; W. H. Aiken, of Wright's; W. H. Jessup, of Haywards; F. C. DeLong, of Novato. On motion of Mr. Webb, Mr. C. H. Dwinelle was added to the committee.

AGRICULTURAL STATISTICS.

Mr. W. H. Aiken offered the following, and asked that a time be set for a discussion of the matter:

WHEREAS, We believe that statistical information as to the quantity and condition of the products of the soil in this State would be of great benefit and interest to the people, and that such information can be best obtained and published by the State of California; therefore, by the State Convention of Fruit Growers, assembled at San Francisco, this the first day of October, 1884, be it

Resolved, That the Legislature should provide by law for the publication of monthly crop and stock reports, by the passage of an Act substantially in the words as follows:

"An Act to provide for the publication of monthly crop and stock reports. The people of the State of California, represented in Senate and Assembly, do enact as follows:

"SECTION 1.—That the Secretary of State shall each year obtain monthly statements as to the condition and prospects of growing crops, condition of live stock, the demand and price of labor, the temperature and rainfall; and, as soon after the harvest as possible, he shall obtain statements as to the yield of wheat and other farm, orchard, and vineyard products. He shall also ascertain the quantity of such products marketed, and the quantity remaining in the producers' hands; and the said Secretary of State shall prepare a monthly abstract of the information thus obtained, and shall publish at least five thousand copies for general distribution, and shall furnish one copy to each newspaper and Post Office in the State for public information and inspection.

"SECTION 2.—That it shall be the duty of the Secretary of State to select not less than one person in each township of the State, who shall be authorized and appointed by him to act as

correspondent and furnish the information required by this Act, and such other information as shall be considered useful, without compensation, other than the actual expenses incurred by them; and the said Secretary shall furnish said correspondents with instructions and instruments to be useful in ascertaining and reporting the temperature and rainfall, the same to be accounted for as usual and returned as State property."

DISCUSSION.

MR. TRUMBULL moved that the subject be taken up at once. Carried.

MR. AIKEN: Mr. Chairman, the State crop reporting system has been adopted in some of the most wealthy and prosperous of the Western States. The Illinois State Board of Agriculture, in 1876, first adopted this system and issued its reports through its Secretary. In 1880, the State of Ohio adopted the same system, and the State authorized the issue of monthly crop and stock reports by the Secretary of the Ohio Board of Agriculture. The State of Indiana soon followed, and correspondents were appointed for the several counties, from three to five. The State of Michigan departed from this plan in some respects. The law in Michigan authorizes the Secretary of State to appoint correspondents in each township, and that the Secretary of State should issue for public use and inspection, monthly reports. I must say, in the examination of those laws and their workings, that I was very much impressed with the fairness and the reliability of the reports from the State of Michigan, and in drafting this bill, I was governed very much by their experience, although it is not a copy of the Michigan law. It is merely taking some of the ideas of the Michigan law, and adapting it to the State of California and our industries.

I will now refer to the reasons why these States established the State reporting system. The law of supply and demand should fix the price of our products. That must be admitted. Under the natural course of events, the law of supply and demand does fix the price of the products of the soil, but the people of those States soon learned that the speculators had a great deal to do with fixing prices in their interest, and not in the interest of the producer or the consumer. These speculators were mostly living in the cities; they commanded large means; they organized and sent their agents throughout these great Western States, regardless of expense, and gathered the most reliable information from all portions of those States regarding the outcome of the crop. They were able to obtain such information for their own special benefit, so that they could absolutely fix the price of the products of the soil, and the producers were absolutely at their mercy. They had a monopoly of information, and they used it, as monopolists generally do, for their own benefit. The producers soon found that they were entirely at their mercy; but experience taught them that if they wished to obtain the information desired, they must do it for themselves, and use the same means that were used by the speculators. The question may be asked, Why should the State undertake this work? Well, the fact is, the State is alone in the position to obtain promptly the reliable information desired by the producer. If it were possible for the producers to organize, one might say they should do the same as the speculators, and obtain the information at their own expense; but when we stop to think of the vast expanse of territory, and of the number of producers interested, we can see some of the difficulties in their way. The producers are so distrib-

uted, they live at so many different points, that they cannot be gathered together. They cannot unite, but, supposing they could do so, they would not accomplish much. It would be merely an interested report of one class of men—the producers—set up against the interested report of another class of men—the speculators. While the speculators would send a story of plenty and of a great surplus, and attempt to depress the price, the producers would tell a sad story of rot and blight, mildew, bugs and worms, and of a small crop, and demand a big price, so that the general public would have no reliable information from either side. On the other hand, the Secretary of State, as provided by this bill, would be in a position to get the most accurate information, compile it, and make an honest, fair, and full report monthly of the products of the State and the prospects, that would be of interest to the producer, the speculator, and the dealer, and also to the consumer. Then it would place everybody on an equal footing, and the producer would not need to be cheated and deceived, because he would have the same means of knowledge that the dealer would have. Now the national census law, requiring a census once in ten years, is valuable, as showing the population, property, and valuation of the products of the United States. The Agricultural Department at Washington has depended very much upon the reports made by these great western States through their monthly investigations.

BENEFITS OF THE SYSTEM.

I might now refer to the benefits to be derived from such a system. That would open up a subject for discussion. There is one instance in my mind: In 1881, which was said to be a kind of off year in the United States as to the products of the soil, the department at Washington reported from its estimates that the crop was not large; that there was a great shrinkage, and that there would be but very little surplus. The interested speculators, however, in Chicago and other western places, estimated the wheat at over 100,000,000 bushels more than the Agricultural Department at Washington. The department, however, was sustained by the monthly reports of Illinois, Michigan, and other States, and through that timely information coming from the department at Washington, and also from those States, the producers, in 1881, as estimated by the Agricultural Department at Washington, in corn, cotton, wheat, and other products of the soil, actually saved \$20,000,000, that would only have gone into the pockets of the speculators if they had been able to stuff down the throats of the producers the fact that there were something like 500,000,000 bushels of wheat, when in fact there was less than 400,000,000 of bushels. Now, that is one instance.

The Secretary of the State of Michigan estimates, and he gives the figures to show it, that the State crop reporting system of Michigan saved to the producers of that State \$2,000,000 by the information that had gone through the State and been received by the producers each month. Now, that is a very striking example of the result of the State reporting system in its infancy, and the good result has gone on from year to year, so that in Ohio, Indiana, and Michigan, they will not do without it. They attempted two years ago in Michigan to repeal their law, and the newspapers came out so boldly, and the producers were so interested in it and opposed to its repeal, that

after the bill was introduced no one in the Legislature would move its adoption, nor dare to do so. The expense in the State of Michigan is very small. They only pay expense of postage, or something of that kind, only a few thousand dollars, and the results, as shown by the Secretary of the State of Michigan, are very great.

It is not the object to raise the price of produce to the consumer; that will not be the effect of it. The fact is, the consumer pays about so much any way. The speculators get hold of it, and hold it, and charge the consumer for it; and the profits, instead of going into the pockets of the consumer or producer, go into the hands of the speculator.

The producer expects the middleman, or speculator, to make a living, but we don't want to let him gather in quite all the profit from the sale of the crop. The man who grows the crop should have some of the income, and the man who consumes the products should have them at reasonable prices. The adoption of the State reporting system in the States I have mentioned, has done a great and a lasting good in causing a distribution of the wealth and products of farming.

WHAT IS PROPOSED FOR CALIFORNIA.

Now, I wish to refer simply to this State, and the working of this particular law. The plan is broadened out a little, owing to our climate and the variety of the products of our soil. The theory of this bill is, that the Secretary of State shall select one or more men in each township—competent men, irrespective of party politics—such men as would be recommended to him by those most interested, for instance, by the Grange, the fruit growers, or the Horticultural Society. It is almost impossible for a man, appointed to report condition of crops in a whole county, to do the subject justice; but an intelligent man who would make an effort could obtain all the information in his town necessary to make his monthly reports to the Secretary of State, the State paying all the expense incurred. The man would take much more pride in doing his work well, who was appointed for his fitness, than he would if he was working for pay. He would be only too glad to serve his State and serve his people by making these reports. I don't think that the objection could be raised that we haven't the material, that we haven't the men in the State of California interested in agriculture and horticulture, who would be willing and able to make these reports monthly to the Secretary of State. They have such men in Michigan, they have such men in those great Western States, and it can't be possible that we haven't plenty of such persons in the State of California. We certainly have.

IMMEDIATE RESULTS.

If this matter of State crop reporting should be adopted by the Legislature, and the Secretary of State should be authorized to appoint correspondents in each town, the work could commence and go bravely on, and within a year or more we would see the good results. It certainly would be of great interest and value to those engaged in horticulture. The fact is the Fruit Growers' Association have been obtaining this information as to fruit alone, or have been endeavoring to do so, and to make monthly reports to the members of the association that I hope have been of some value. They were

obtained at some labor and expense to us, and the estimates, I think, of the products of the State, have been reasonably correct, but you can hardly imagine the difficulty we have had of making a reasonably reliable report. Why? For want of this very information; for the want of reliable information from every township in this State. We had information from Riverside, Los Angeles, Vacaville, and from other strong fruit sections; but it is not the strong fruit sections, after all, that make up the great surplus of fruit that we have; it is these little orchards, these home orchardists that sell their products. It is astonishing where fruit comes from; from every hill, valley, and nook, and from small places of ten, fifteen, and twenty acres, the fruit comes in, and the aggregate is so large that it makes these estimates from those great orchards alone of but little value. If this system should be adopted by the State it would entirely relieve the Horticultural Society from furnishing this information for the benefit of the horticulturists, or from any unnecessary expense, or any outlay for obtaining reliable information. The State would be able to furnish information that would be of benefit to all. It would be for the interest of the consumer; it would be for the interest of the dealer, and for the interest of all those engaged in this industry and for all the industries of this State. The expense would not be large. The State is alone in a position to undertake it, and I think if we should adopt this resolution, as it has been adopted by the State Horticultural Society, it would be adopted by the Viticultural Societies, and it may go before the coming Legislature which such indorsements that they may see that something should be done to place this State in the foreground, and place it side by side with the great States of Illinois, Ohio, Indiana, and Michigan.

METEOROLOGICAL.

I want to call your attention to one point in this resolution, and that is as to the reports on rainfall and temperature. There are two things we have to contend with in this State, rainfall and frost, both very destructive at times. Now if we could all be advised of the temperature and the rainfall in each township, it would throw a good deal of light on the subject of what could best be raised in that township; what kind of fruit.

Now take the laborer; if he did not read the newspaper, he could, by going to the Post Office, receive from the Postmaster the monthly report, and examine where labor was needed and the prices paid, and it would thus be of great benefit to him.

MR. TRUMBULL: What is the estimated expense for the carrying on of this system in case it was ordered by the Legislature? It would require at least one person to tabulate these reports.

MR. AIKEN: The Secretary of Michigan writes me that as soon as he receives these reports, in order to have the work promptly done in a few days, he puts his whole force at work in making up the report so it can be got out within three days after the reports are in, and no further attention is paid to it by his clerks until the time comes around again. I think he states that the compensation and all the incidental expenses amounts to only about \$2,000. I think the Secretary also wrote me that he was not in favor of paying these township reporters, claiming that they should not be salaried officers; they should be appointed on account of their fitness and will-

ingness to do everything for public good and the interest of the people, but they should not bear the expense. In Michigan, the township reporter bears his own expense, but I think that this State is able to bear the incidental expense of obtaining such information.

MR. TRUMBULL: I think that is a very wise move. As I understand Judge Aiken, it is not in contemplation to pay the officer.

MR. AIKEN: Not at all.

THE SYSTEM APPROVED.

MR. TRUMBULL: I think the entire expense should be consumed in the circulation of these reports. I heartily favor this. I think it is necessary, and I think that we should have some one to bring it before the Legislature. I would make a motion that Judge Aiken, who introduced it, be the representative from this convention, to urge the matter upon the attention of the Legislature.

MR. WEBB: I most heartily concur in all that Mr. Aiken has said as the operation of this law, and I will say further, that the Fruit Growers' Association that was established here last Spring, to my own certain knowledge, did a great deal of good. The statistics that it was able to gather and furnish its members enabled them to obtain better prices for their fruits than they would otherwise have obtained, because they were armed against the false reports that were circulated throughout the State respecting the fruit crop, representing it as being far greater than it really was. Whether those reports were circulated by interested parties or not, I shall not say, but it is evident to my mind that many of the fruit growers, by reason of the valuable information that they received from that source, were able to get much better prices than they would otherwise have received.

MR. JESSUP: I heartily approve of this resolution. In my opinion, there is nothing that contributes more to the interest of the horticulturist and agriculturist than statistical information. It is one of the things that we have had to battle against, this lack of statistical information. For lack of it we have been groping in the dark ever since we have been producing in California. The producer knows nothing about the yield or about the product of the soil that he is engaged in cultivating; he knows literally nothing. But the speculator, as Mr. Aiken says, knows it all, and can take advantage of his superior knowledge. Now, I think that the State should bear the expense of gathering this statistical information as a duty they owe to the producing class. They owe nothing to the speculator. The speculator contributes nothing to the wealth or prosperity of the State; the producer has to do it all, and it is proper that the State should guarantee their protection. There is one point contained in that resolution that I deem of very great importance and a vital one, and that is the obtaining of statistics of the number of trees planted of each variety; the age of those trees, where it can be got, accurately, or if not, approximately; and also the acreage of all kinds of grain planted, all of which could be gathered at the same time. This is a subject that should interest every one, and it would be a blind Legislature that wouldn't pass that law. Even if it costs them \$50,000 a year, the State would be a gainer by it.

THE WORK OF THE ASSESSORS.

DR. CHAPIN: Right in connection with Mr. Jessup's remarks, I would like to call attention to the fact that the assessors of the different counties of the State, in an uncertain, careless manner make provision for arriving at the number of fruit trees of a few varieties that we have in the State. The law regarding the assessing of property in the State should be amended so as to require as a part of the duty of the assessors, that they make a careful enumeration of these fruit trees, the same as all other property of the State. It should be revised so as to secure this exact statistical information we need, regarding the number and the age and bearing condition of all the different varieties of fruit trees that we have growing. I would like to see that done, and in my estimation there is no other way by which we can possibly arrive at correct statistical information regarding the fruit trees of the State.

MR. HATCH: I feel very thankful to Judge Aiken for bringing up this matter for discussion. It seems to me that it is a move in a direction which will benefit us. It seems to me that there should be no one disposed to take an opposite position in this matter, for all parties in our State will be benefited by it, and, therefore, if carried to the proper head, without any doubt we may expect relief. A few of us have tried gathering these statistics on a small scale and we found it very difficult to arrive at any certainty, where we have so few to derive our information from and so little money at our disposal to employ men to obtain it by traveling after it. We had none that we could use for that purpose, and, therefore, any information that we obtained was meager and uncertain, and, I might say, but very little benefit to be derived from it—in fact no benefit to be derived from it in comparison with what might be derived by these means. Even if it was successful, but few could be benefited, for none could receive the benefit of the information unless they participated in the expense. It seems to me that this is the move to make, and I see no reason why we should not be successful in this endeavor.

MR. DELONG: There is one thing in connection with this: I think you will find that it will not be so easy to pass this law as some of you think. When the fruit growers went before the Legislature two years ago to get a bill passed for a State Board of Horticulture, it was all they could do to get it through; and the different people from the different portions of the State would contend that their particular section of the State had no interest in such a bill. There was a terrible objection from San Francisco alone to voting for any appropriation to keep the Board in existence. It met with very strong opposition on that score, and when we go there and ask for appropriations that are going to benefit any particular class of people, such as the fruit growers or the grain growers, or the producers of the State, you will find that it will be very difficult to secure them. Now, one other point which was alluded to by Dr. Chapin, where he says the assessors attempt to find out the number of trees. There is a very decided objection on the part of every one to give that. You understand that there is a constitutional provision which says all fruit-bearing trees are an improvement on the land. Some of the assessors look at an orchard and inquire how much of an improvement there is, and, without regard to the number of trees, assess it so many dollars and so many cents. The officer will come along and want the owner to enumerate

the trees, and then, in the goodness of his heart, he will want to see that every man don't fall behind in the enumeration. You will find that when the assessor comes around the man is not very anxious to tell how many trees he has. If you will simply estimate this thing, to find out how much fruit a man is going to have, you will get at the same information; but I don't think there is any man that will be found anxious to swear the value of his property away. Another thing: while I am in favor of the measure proposed by Mr. Aiken to get statistical information in this State, I think the fruit growers will miss it if they don't keep up the association they have for gathering information, because the speculators are on the *qui vive* all the time, and I think the fruit raiser ought to be equally as well armed as the speculator, to a certain degree. Last year we attempted to get as full information, and I think it was fully as reliable as theirs, and it enabled us to get remunerative prices last year. Now, if this was dropped by this association, on the idea that the Secretary of State will do it, I think we will miss it. At the same time, it is a good thing to know at the end of every month, and certainly at the end of every year, what the estimated prospects are, and what the real quantity of fruit raised in the State is. It gives us a basis to work on for the next year, and after getting our information we of course can deduct or add, according to the information we get from individual members for our own information. I don't want to be understood as opposing in any way this measure. I only want to say that if we get this statistical information it will cost something, and when you go to the Legislature for an appropriation, in order to get that, you will find that you will be met at the outset by a far different feeling than what we have any idea of.

THE BILL GENERAL IN ITS CHARACTER.

MR. AIKEN: I will say in explanation that this bill was not drawn in the interest of the fruit growers, or in the interest of the wheat growers; it is in the interest of the producers and the consumers.

MR. DELONG: Let me ask you one question right here: What interest in common has the County of San Francisco with the County of Santa Cruz? The County of Santa Cruz will favor a bill for this statistical information; it gives the fruit growers of that county the knowledge they want. But what interest has the County of San Francisco in common with that county? They will meet you on that proposition and say the people of San Francisco have no interest in such a bill. They will tell you that of the money to be appropriated to get such information there is a certain percentage that the property of San Francisco has to pay, and for which they will derive no benefit, and you might try to convince them by arguing that the fruit growers of Santa Cruz County will be assessed so much more, and they pay a certain proportion of the taxes for which the City and County of San Francisco get the benefit, but you couldn't get them to see it in that way. Now I think there ought to be provided some means by which each county could pay, for they don't want in San Francisco to pay anything that will inure to the benefit of Santa Cruz or any other county.

MR. AIKEN: You seem to refer to fruit only.

MR. DELONG: I refer to the producers.

MR. AIKEN: I will say that the City of San Francisco has an interest in the products of the soil of this State. San Francisco lives, breathes, and has its being simply through the products of the State of California. The merchants couldn't buy goods; they couldn't pay for the goods; the goods wouldn't be consumed, if the producers of the soil didn't furnish the sinews of war to carry the State on. Now the City of San Francisco, this very instant, depends upon the prosperity of the producers of the products of the soil. The laborers, the dealers, and the consumers are all interested in it. The producers are always willing to divide with the consumer, but they don't want to have the difference between the price paid by the consumer and the price received by the producer all go to the speculator. We want a little division; we want to bring the producer up a little in price, and we want to bring the consumer down so he can get it a little cheaper and the producer can get a little more. Now, if that is not for the benefit of the State of California, if that is not for the benefit of the City of San Francisco, I don't know what is. The point made by Mr. De Long, that the fruit dealer there don't wish to pay taxes on our fruit, has no relation to this; that is narrow; this is broad—broad as the State; broad as the world. Now, the expense. You talk about appropriation. Supposing we ask for an appropriation to pay for postage stamps from the State, is that going to bankrupt the State. And where we want several thousand postal cards. The Secretary of State uses postal cards, and that expense would not be large. The Secretary of Michigan says the whole thing there only costs about \$2,000. The State of Michigan is not troubled about the \$2,000, and this State shouldn't be troubled about \$20,000. The Legislature will, I think, make any appropriation that the committee sees fit to recommend, and sustain any effort that will inure to the greatest good of all.

MR. WENTWORTH: I think that the motion now pending before this convention is the key-note to the future welfare of our State. I must say, with all deference, that I was somewhat surprised at the remarks of my friend Mr. DeLong, in reference to the interest that San Francisco has in this information. Why, San Francisco is entirely dependent to-day upon the interests as developed in the interior of our State, and our business men are making arrangements for the purpose of inducing immigration to our State. And why? Simply to develop the latent resources of the State through that immigration. Another objection raised by my friend Mr. DeLong was that we couldn't get the Legislature to act in this matter. It strikes me, Mr. President and gentlemen, if you will instruct your committee to go before every legislative applicant of this State, of both parties, and show them that the interest and welfare of our State demands this information, you will succeed with the Legislature when it assembles.

Now, gentlemen, the fruit-growing interests of this State are as important, and I think I should be justified in saying more important, than almost any other one interest. It is certainly of more importance than the wheat-growing interest, because wheat, as we know, is not as remunerative as the right kind of fruit, and there will be no limit to the demand for the fruit which California will produce. The broad world is a market for us, and our State will become one of the most prosperous in the Union, through our fruit, if properly attended to and properly packed and presented to other markets.

We are all of us interested in this immense area that we have in California. Only stop and consider for a moment, and see how sparsely settled it is. Look upon the one hand, and see its productive capacity, and on the other, how few we have to develop and produce from this immense area. Now, see how valuable this information will be to the new-comers who arrive here for the purpose of securing homes. Just the very information which that bill suggests is what we want to give to those new-comers. They will know then the section to which they may go. They will know before going there just what they can produce; they will know about the rainfall and about the climate, and all the various information covered by this bill. This will be information of an intelligent character to impart to the new-comer, and thus, perhaps, save him from expending all the little means he may have in going to the various sections of the State to discover where he may best locate.

MR. DELONG: I don't know but what you have got a wrong impression from what I have said here. I don't want to be understood as opposing this measure. I merely wished to point out the difficulties in our way, and the arguments that we are likely to be met with, should we go before the Legislature with this bill. Certainly whatever I can do or say, I will do and say towards pushing it through.

The motion of Mr. Trumbull, that Mr. Aiken be appointed to present the matter to the Legislature, was carried. The convention adjourned to two o'clock P. M.

AFTERNOON SESSION.

The convention met at two o'clock P. M.

MR. WEBB moved that the discussion upon statistical information be temporarily deferred. Adopted.

MR. WEBB then presented the regrets of Mr. Henry Edwards, expressing his inability to appear before the convention, on account of being engaged in preparations for his immediate departure. The report was received, and the committee discharged.

MR. WEBB read a letter from W. M. Williams, of Fresno, accompanied by specimens of the Lyon cling peach.

MR. MILCO moved that a committee be appointed to examine and report upon the peaches shown. Carried. The chair appointed Messrs. Milco, Hixson, and Morse.

THE NEW ORLEANS FAIR.

By invitation, COLONEL A. ANDREWS, Commissioner for California, made a stirring address upon the advisability of making a good exhibit at the New Orleans Fair. MR. C. B. TURRILL also addressed the convention, concerning sending forward sample products; and MR. JESSUP reported on his progress in obtaining desirable fruit to exhibit.

On motion of MR. WEBB, Mr. Aiken was requested to appear before Governor Stoneman, and ask him to recommend the passage of the bill for the collection of agricultural statistics in his message to the Legislature. Carried.

ADDRESS BY GENERAL BIDWELL.

HON. JOHN BIDWELL being invited to address the convention, spoke as follows:

Mr. President and gentlemen of the convention: I am so unaccustomed to making remarks in public assemblies, that I doubt my ability to say anything to instruct or even entertain you. It gives me pleasure, however, to say this: that I feel a great interest, as you know I must, in whatever tends to the prosperity of this State, having been identified with this coast for some time, and probably shall be as long as I have a being. I came here, of course, at an early day, when I could count all the houses in San Francisco on the fingers of my hands, and all the houses in the Sacramento Valley and the San Joaquin Valley—there were none in the San Joaquin Valley—but in the Sacramento Valley I could count them on the fingers of one hand. I have seen and you have all participated, no doubt, in the prosperity of this State, in its mining and agricultural development, until the agricultural overtook and even surpassed the mining interest on this coast. I have seen the production of wheat expand into a great interest, one that commanded the attention of all enterprising men. It is possible, I believe, Mr. President and gentlemen, that some of you will live to see the fruit interest on this coast surpass that of wheat, and perhaps every other interest. When we see what has been done, and see how little surface the industries now cover, and look upon the broad plains and the mountain slopes and consider what it can be were its development to go forward, it is beyond the comprehension of any ordinary man to compute the extent of the undeveloped capabilities of this coast. As long as I have been here, going on forty-three years, sometimes I seem but a child; it seems as if I was a stranger in California. I never come to this city, and never visit the fair, but that I learn a great deal, and learn with a pride that a citizen must have, because everything here seems to compare so favorably with what we see elsewhere. Once I went abroad for a few months, in Europe. I never saw any place there that I thought would compare with California—in fertility, in beauty, in anything. I believe, gentlemen, that you occupy a country second to none anywhere; one in which you can all afford to take a pride; one that cannot be surpassed in its natural features or salubrity of climate; one, in fact, that must inevitably attract to it vast multitudes. The volume of immigration must necessarily increase until it makes this one of the centers—as I believe, one of the great desirable points for people to find, to come to, to live in, and to develop. And I believe that your convention here to-day is working in the right direction; it is in the direction of progress, and I think it should commend itself to good people and enterprising capitalists everywhere, not only here, but on the other side.

I remember the time, gentlemen, when there was no fruit raised in California except at the old missions. Some attempts were made on the ranches to raise a few grapes and perhaps a few pear trees, but they were invariably failures, so far as I know. There was a little apple orchard at Fort Ross, on the coast, and perhaps there I made the first cider that was ever made in California. I made it in the Summer of 1842, and packed it on horseback from Fort Ross to Bodega, and if ever a man had a time in getting his treasure home, I

had it. The barrel was only half full—a full barrel you can pack on and keep it on, but a half barrel that goes this way and that way, it is pretty hard—but we finally got it there. We came to believe that the old priests had some superior knowledge about where fruit would grow, and that it wouldn't grow anywhere else. I naturally supposed that fruit would grow here, and as early as 1845 I helped to carry some fruit trees from the San Joaquin Valley to Tejon, crossing King's River and taking them to Sacramento. But they wouldn't grow, and we didn't know what was the matter. Still, I had an idea that there was a way to make them grow, and followed up that idea, and in the Spring of 1848 tried it again. We couldn't do it any sooner; we had to carry on wars. First, we had the war of 1844—a kind of war among ourselves. We were resting in 1845. In 1846 we had another war, which lasted until the year 1847. We rested that year, and I wanted to get some more trees, and I went to a man in San Rafael to get trees and grapevines. I had a sore hand and couldn't work. The scars are on my hand now, where it was swollen then, and I couldn't do anything else but go after fruit trees. So I got on a horse and crossed the Sacramento Valley, crossing the Sacramento River where Knight's Landing was, to get to San Rafael. And, bye-the-bye, I took the first news of the discovery of gold at that time to this town. Nobody had heard of it up to that time. And then I picked the first growing peach, I guess, that was ever picked in the Sacramento Valley. I picked it that Spring. I got everything to running very well after that. I got my trees all planted, and then the first gold excitement broke out. It didn't break out on the discovery of gold, for everybody thought the gold would all belong to Captain Sutter, and everybody wished that Captain Sutter would get rich, as he had had a hard time; and when the men first went up to the mines where Captain Sutter built the mill, they acknowledged his right, and he let them dig on shares. That was all right. Nobody pretended to dispute his right to the gold.

I am making just such a speech as I always make—a rambling one. I have listened to some of your speeches, and have been pleased very much, and all I can say to you is, that I hope you will have a great many conventions, and that you will go on increasing until this hall will be too small for you to congregate in.

VALUABLE PEACHES.

The committee appointed to examine the Lyon cling peach sent by W. M. Williams, of Fresno, reported in its favor, recommending it as a valuable peach. On motion of MR. WEBB, the Lyon cling was placed on the list of prominent peaches of California.

MR. HINKLEY, of Novato, presented a large and excellent white cling, which was highly praised as a valuable peach for all uses.

MR. C. H. DWINELLE, Chairman, presented the

REPORT OF COMMITTEE ON ENTOMOLOGICAL PROFESSORSHIP.

Mr. President and Gentlemen of the Fruit Growers' Convention:

As Chairman of the standing committee on endowment of the entomological professorship, I have the honor of presenting the following report of progress: At the close of the last convention, the

members of this committee (in consultation) decided, that to endow the chair of entomology in the University of California, the sum of not less than fifty thousand dollars (\$50,000) would be needed, and that those interested in the various branches of agriculture and allied industries in this State, could well afford to give that sum. Each member of this committee has done what seemed best to bring the matter before the public, and press it upon the attention of individuals. Besides personal appeals, the columns of several newspapers have been used to advocate the measure. The Chairman lately prepared a statement of the present status of entomology at the University, which was published as Bulletin No. 16 of the Agricultural Experiment Station, and which is here incorporated as a part of this report.

ENTOMOLOGY IN THE COLLEGE OF AGRICULTURE.

The study of entomology has been gradually given a place in the College of Agriculture as a matter of necessity, to meet the pressing needs of the State. Several years since numerous inquiries from those engaged in various branches of agriculture showed the want of a more definite knowledge of insects and their habits, and of methods of combating those which are noxious. These were met as fully as could be by correspondence, and by publications in pamphlet form, or in newspapers.

In this direction have been Professor Hilgard's pamphlet on the "Phylloxera," with full illustrations, published in 1880, and the writer's contributions to the first report of the Board of State Horticultural Commissioners, 1882. Mr. F. W. Morse, Analytical Assistant for the College of Agriculture, has for several years made a special study of the phylloxera, and has been repeatedly employed by the Board of State Viticultural Commissioners to examine and report upon the spread of the pest in California.

The various members of the College Faculty have also, from time to time, prepared papers and addresses upon entomological subjects, for presentation before horticultural and viticultural societies and conventions, and by conversation with individuals visiting the University, or met during expeditions into the country, have done what they could to disseminate knowledge upon this important subject.

INSTRUCTION TO STUDENTS.

Seeing the importance of a close acquaintance with insects, injurious and beneficial, to the coming farmers of California, the writer undertook, in addition to the work for which he was engaged, to give a limited course in General and Economic Entomology to students in the College of Agriculture, and such others as might wish to join the class. This was at first experimental, but it so far met the approval of the students, and of the Faculty of the University, that the study was made one of the regular requirements for Junior year in the College of Agriculture. Our experience up to this time has shown that more extended work should be done in this department by a professional entomologist.

CONTRIBUTIONS RECEIVED.

The College of Agriculture acknowledges valuable aid in time past from public spirited citizens, who have contributed liberally to strengthen its entomological resources. The Ricksecker collection of several thousand specimens of beetles was purchased at a cost of \$400, donated by Captain J. M. McDonald of San Francisco, Mr. Matthew Cooke of Sacramento, and Mr. Cutler Paige of San Francisco. Considerable clerical work, etc., was paid for by various sums given during the years 1881 and 1882, by the following named gentlemen: R. B. Blowers, J. D. Stevens, A. T. Hatch, John Rock, James Shinn, W. W. Smith, W. H. Jessup, M. T. Brewer & Co., and E. T. Earl.

PREPARATIONS FOR TEACHERS.

There is a very strong feeling growing up that some instruction in the elements of entomology should be given in our public schools. Until there is a more general understanding of the nature of insects, and the ways in which they are spread from place to place, there can be little hope of that general coöperation which is essential in all successful efforts to keep them within bounds.

At the State Fruit Growers' Convention, held in San Francisco in November, 1883, the following resolution was adopted:

WHEREAS, The fruit and vine interests bid fair to become the leading industries of this State;
Resolved, That we, in convention assembled, as representing the fruit growers of this State, do urgently and earnestly request, pray, and by right demand the introduction into our public schools of the study of economic entomology.

ENDOWMENT OF A PROFESSORSHIP.

The tillers of the soil are by no means the only class of our citizens who are beginning to realize the immense losses which yearly take place through the ravages of insects. Dealers in animal and vegetable products, raw or manufactured, have these tiny robbers too often brought to mind. Considering the enhanced cost of things which they attack, we may safely claim that every one is interested in the question of their control.

At the convention above mentioned, the writer presented a paper upon "The Need of a General Knowledge of Insects," and proposed that the want should be met by providing the funds necessary to enable the Regents of this University to fill the Chair of Entomology, which they established several years ago. The following words were used: "We ought to have a thorough entomologist to teach entomology to our horticulturists and agriculturists generally, and to those who are to become teachers themselves, as a large number of graduates take that course. We want the very best man, that can be had, * * * who is in the prime of life, so that he has many good years of valuable service to give us, and who will come here with the understanding that he is to be an instructor in entomology, as his great work, * * * and who will devote himself in every way to advancing entomological instruction and will act for the good of the whole State, beginning, of course, at home. * * * The State has done a great deal for the University of California, and I believe it is a proper thing just at this juncture for those who specially want general information on the subject of entomology, to be

used in the line of their business, to put their hands in their pockets, and it is probably a very serious question whether it would not be the very best investment they could make, to put a few hundred, or thousand, or five or ten thousand, according as they have been prospered, into an endowment of this chair. I see gentlemen here who could well have afforded to have done that ten years ago. It would have been thousands of dollars in their pockets, and I do not think they will question my figures. I have known of their spending \$1,500 in a month, apiece, in fighting their pests, which they and their neighbors ought to have known all about, and to have stamped out in their incipency. Now, this is a serious matter, and I hope that you will give it the most serious consideration. * * * I bring forward to you, gentlemen, a practical proposition for the good of the State, not only in future generations, but within your own time."

The proposition was strongly approved of by Professor E. W. Hilgard, of the State University, Mr. Matthew Cooke, Dr. S. F. Chapin, and others, and indorsed by vote of the convention.

The following committee was appointed to consider the proposed endowment, and to solicit contributions towards it: C. H. Dwinelle, University of California; Hon. William Johnston, Richland; Dr. S. F. Chapin, State Inspector of Fruit Pests; Matthew Cooke, ex-Chief Horticultural Officer; A. T. Hatch, Cordelia; E. J. Wickson, editor *Pacific Rural Press*.

The committee estimate the sum needed at \$50,000, a small amount when the interests affected are considered.

Enough money has already been promised to make a respectable nucleus, and all who are inclined to help on the good work should report at once to some member of the committee.

As a result of these various efforts, the committee have received the following conditional offers of money for the endowment fund: A gentleman who is a landholder on a large scale, and is starting a nursery business, promises five hundred dollars if the fruit growers and others most interested take the lead and subscribe liberally, as they should. Another, a liberal-minded capitalist of this city, says: "Get the men interested in fruit raising to put down their subscriptions, and I will help them as much as they help themselves."

Your committee respectfully urge the importance of such action as will secure these sums and give an impetus to a movement that is most worthy of success. We further ask the coöperation of individuals and local societies in all parts of the State to arouse interest and secure subscriptions in large or small sums. A form for a subscription paper has been prepared, and can be seen on application to the committee.

For the committee.

C. H. DWINELLE, Chairman.

Adjourned until Thursday morning.

THURSDAY MORNING SESSION.

On Thursday, October 2, 1884, the Convention met at ten o'clock A. M., Vice-President A. T. Hatch in the chair. Upon invitation, Mr. I. F. White addressed the convention as follows:

MR. WHITE: Mr. President, I was going to make a motion that the

subject of fertilizers be taken up. In our part of the country it is going to be a problem as to what we are going to do for fertilizers. This being a fruit country, we have no stock to furnish us fertilizers, consequently we will have to depend upon chemical fertilizers, and I would like to hear from some of the members as to how they succeed, and what is the best.

So far as the fruit interest is concerned in our section of the country, it is young yet, still all kinds of fruit seem to succeed remarkably well, especially the peach and fruits of that class. We have no boom up in our country, but it is coming up gradually, and every year adds new members. Those that come here are generally of a class that are rather limited in their means, consequently they don't make much of a show. There is no rapid advancement, but they come in gradually. It has been demonstrated that we have an excellent fruit country, and our valley is A No. 1. We are on the line of the Central Pacific Railroad, and we ship our fruits. Land in our section of the country is comparatively cheap as compared with other parts that I have been in. The orange does finely with us, only the last two years we have had extremely cold Winters, which have somewhat retarded them. After oranges are two or three years old there is no danger, but when they are young the frost is liable to kill them; sometimes it cuts them down; but after two or three years they do remarkably well, and are free from scale bugs. This season they are light. I have one hundred and fifty orange trees which, perhaps, average one hundred to the tree, and if it wasn't for the frost two years ago they would now be good trees. I have some trees that missed the frost that are quite fruitful. Probably they will have two hundred and fifty to the tree. Our oranges are very similar to the Riverside orange. I was down there this last Spring, and I couldn't help but notice that our fruit is clean and fresh, much better than it is in Los Angeles.

We had some of the peach moth last Spring, but hardly enough to affect the fruit. We have some of the codlin moth, the same as others. In some places they have made an effort to eradicate them, but all efforts seem to fail. The right kind of peaches do well there; the Morris White does remarkably well; apricots do passably; they are not sure every season. About every other year we have a good crop of apricots. There have not been a great many raised yet. Plums of all kinds seem to do remarkably well. Pears, Bartlett's especially, do finely. Apples we don't boast of; the early red apple, the Red Astrachan, is the only one that we prepare for the market, as it comes very early and is not captured by the codlin moth, like the late varieties. We have so much sun they color up very nicely; the same way with the peach. We have but very little curl; the Heath cling has it, but we are discarding that peach. Georges Late cling and the Salway were scarcely affected. Hale's Early had a heavy crop, the Salway an early one, and the Georges were late; the Susquehanna was late. We know more of the late varieties in our section.

THE APRICOT FUNGUS.

MR. GRAY: There is one subject that I hope will be discussed when the proper time comes, and that is the shot-hole fungus. It is doing great damage, I understand, in some parts of the State, and in Sacramento County it is nearly ruining the apricots. We have had

a little of it now for the last two years, and if there is any remedy, I would like to know what it is.

DR. CHAPIN: It is very difficult to tell what will be effectual in destroying it. It is very hard, where fungus of that character affects both the trees and fruit, to apply remedies at that season of the year to entirely destroy it. In some localities it is very bad indeed, most all the leaves falling from the trees and affecting the fruit so seriously as to almost render it practically worthless for any purpose. In other localities it very slightly affects either, while it may perforate the leaves, and in places there is just traces of it; but it may be said to prevail in all parts of the State, and it not only affects the apricot, but it affects other fruit trees as well. While on a visit to the Santa Cruz Mountains this Summer, I found, in one orchard, it affected the apricot, the peach, and the almond. There are some localities from which I have recent communications, and also visited this season, where it has been very destructive—in fact, destroying the crop, practically. I suppose that the best remedy is spraying the trees with washes of whale oil soap, sulphur, sulphate of iron, and tobacco. This is quite effectual in destroying the fungus growths, and a mixture of that character, I think, would be the most useful that I could recommend; but it is a very difficult matter to apply anything that will entirely eradicate this disease, from the fact that it extends over such a great surface of country, affecting more trees than any other single disease. Besides, the spores of the fungus will be distributed over a large extent of country by the wind, and while washing one tree and practically destroying the growths on that, it will reappear from being brought from other localities.

MR. MILCO: I will state that a neighbor of ours had some apricot trees infested with this disease, and he was assisted by a lady that came from the East. Under her instructions, he took his knife and just peeled the bark of the trees, cut the bark from the crotch of the tree down, on each tree, and the result was that the trees, for two years, have grown clean clear fruit.

DR. CHAPIN: The only way that that could have a good effect would be by increasing the contraction of the tissues on the back of the bark, and cause an entirely free and unobstructed flow of sap, and give greater vigor to the tree; in a measure, enable it to outgrow the fungus. I doubt very much that that process would result in entirely obliterating the disease. I don't see how it could have that effect.

MR. MILCO: I will state that the slitting is done on the north side of the tree so as to prevent the sun doing injury. I have seen a tree split myself and it showed a clean seam where it was cut, and it seemed to be a great benefit to the tree; it has shown more vigor and I haven't seen any appearance of this disease on the tree since. I simply speak of this as a fact, and I hope you will try it. It is cheap and seems to overcome the difficulty. If you don't try it on the whole orchard, you might try it on a very few trees, and I am sure you will find it very beneficial.

DR. KIMBALL: I have an apricot orchard that has been somewhat afflicted with this same difficulty. I think I saw the first traces of it about three years ago; I paid but very little attention to it, and this last year I think probably one third of my apricots that were in bearing were very badly affected. Some of the trees were so badly affected that the fruit was unfit for even drying. There was one peculiarity

that I noticed about it, and that was, from the point that it first appeared in the orchard it seemed to spread on every side, and particularly towards the windward. It seemed to pass in a certain direct line over a strip about six or eight or nine rods wide, and outside of that tract there was hardly any trace of it to be found in the orchard. We found also on San Lorenzo Creek, which bounds the west side of my orchard, different varieties laboring under the same infliction. I examined them carefully with my glass, and made up my mind it was the same trouble. About this theory of slitting the bark of the trees, as Dr. Chapin said, I think it has a wonderful effect sometimes in giving an extra flow to the sap, and an increased vigor to the tree, but I don't see how it has anything to do with suppressing the violence of the attack of the shot-hole fungus, except in the manner that he explained—by an increased vigor of the tree and freer circulation of the sap. I have frequently, when I saw a tree that didn't suit me exactly, taken out my knife and cut it down in that way, and on those trees in my orchard where the shot-hole fungus was I saw no particular difference—the infliction was still there. As for remedies, I have tried in a small way a weak solution of carbolic acid, sprayed on the trees, not from any information in regard to whether it would be beneficial or not, but from the general laws that govern that acid, that it is inimical to all kinds of fungus growth. I probably didn't try it early enough, because I saw no good effects from it, yet I think it would be good from what little experience I have had with it. This fungus is going to be a terrible visitation, if not resisted, as the apricot is valuable from its skin being smooth and beautifully clear. If it is speckled all over with these bad-looking spots, it is almost unsalable. It doesn't affect the taste so much as it does the looks, which would prevent it being used for canning or drying.

MR. GRAY: I would like to have the doctor tell us where he thinks the cause lies, where the seed, we will call it, is, and how it comes from one year to another. It must be something that stays somewhere, as we find the leaves when they first come out more or less affected with it. I think any remedy that is applied should be done before the leaves grow. I have an idea there might be strong lye applied once or twice in Winter, with strong sulphur with it, which might kill it. I noticed, as Dr. Kimball says, that it came from the north. About a mile from our orchard, on the north, I heard that there was something the matter with their apricot trees, and I went down there. It was a small orchard, and the trees were large. There were only a few traces here and there. From there I went to other places. Dr. Harkness was up at that time, and he decided that it was owing to the atmosphere, which was very damp, and he thought probably that would be the last of it after that year, but it continued to grow on the apricot trees. That was two years ago. Last year it was not quite so bad, but nearly so, especially around the lower limbs of the trees. There seemed to be a poor growth of leaves, and around the top of the trees, where they came out after the fungus spread, there were good bright leaves. The fruit that was on top was good, while down below it wasn't worth gathering at all. In another orchard, about two miles away, I found just the least sprinkling over the orchard, but nothing to amount to anything, and around the lower part I could find more of it, but I didn't see it on other trees. The early golden apricot it don't seem to affect at all. The body of

the trees and the twigs, where I saw this fungus, are now looking very bad. The bark looks old and rough, like an old oak.

DR. CHAPIN: To obtain the best method of treating this fungus disease will require time. It is something that can't be done in one season. It is very often the case that remedies, so called, which will effect a cure of certain of the diseases and insect pests that infest our trees, are given publicity, and are recommended as reliable remedies in such and such a case, when given a careful test to a considerable period of time, are found to be lacking. So it is not well to be positive with reference to any special remedy until sufficient time has been given to test it thoroughly. This matter of fungoid disease is a very important one, and the experiments that I have been making this season, and which I intend to carry on this Winter and during the next season, I hope will be to a great degree successful, and that the result will be at least sufficient to help us in getting rid of this fungoid trouble. Should they be successful, the information gained by them will be given freely to all interested.

MR. AIKEN: I would like to ask if this shot-hole fungus affects other varieties of trees beside the apricot, the apple, or peach, or plum?

DR. CHAPIN: That particular fungus affects only the apricot. There are other different varieties that affect the apple and other fruits, but this does not.

MR. HATCH: Does it not affect the growth?

DR. CHAPIN: Only so far as destroying a considerable portion of the foliage. Of course we all know that it is absolutely necessary to the health and life of the tree that the foliage should be preserved, and the quality of the crop, of course, depends upon it.

MR. AIKEN: Many of you have noticed, likely, upon your apple trees, this year, the leaf turning dark and falling off, and the end of the twig having a sooty, black fungus growth. The Pearmain and the Newtown pippin, to a certain extent, are affected by a certain fungus, or black spot, here and there. I came across, the other day, in my examination of the reports of the horticultural societies, quite an able essay on this very subject, with reference to the prevalence of this fungus throughout the East and the Mississippi Valley in the year 1881. It appeared to be so bad that year that it almost destroyed the year's crop. I supposed that dark fungus growth was a native of California, and I would like to ask Dr. Chapin what he knows about it, or anybody else.

DR. CHAPIN: I think that it has appeared here before this time, but the particular fungus that Mr. Aiken speaks of has been very destructive to fruit and trees. In the Santa Cruz Mountains, particularly, it has done indisputable damage this season in the apple orchards, the white Winter Pearmain being most afflicted by it, and, in fact, the crop of fruit of that variety has been rendered almost worthless.

MR. AIKEN: Yes, entirely so.

MR. CHAPIN: It has been several weeks since I was there, and the apples were not fully grown, therefore the exact import of the trouble could not be ascertained. Of course it has been by this time. After the white Winter Pearmain, the Newtown pippin is the next worst, the Smith Cider following that, and some other varieties of apples; but some, I think, were not affected at all—at least, they were not at the time of my visit there. The effect upon the leaf is very peculiar.

When it is attacked it becomes brown, blackened, and dried up, and the appearance of the whole limb and all the leaves upon it is as though fire burned over them. All the leaves fall to the ground, and the ground will be wholly covered with these destroyed leaves falling from the tree, leaving the tree sometimes entirely bare of foliage. In that way, of course, it has a very serious effect upon the vigor and even the life of the tree. I wouldn't be surprised to hear that many of those trees literally died from the effects of this fungus. It would be a very serious matter if that particular fungi affecting the apple should spread through the State. Should it do so it would render the crop of certain varieties of apples almost worthless. I don't know that that particular fungus exists in any other part of the State. I haven't observed it in any other locality.

MR. AIKEN: Strange to say, while the apples are suffering on one side of the road, our trees are almost breaking down with very fine apples, perfectly clear from this fungus growth, on the other. I would like to get at the cause of it. The written article which I mentioned refers to the same thing. The writer thinks it was the climatic atmospheric-trouble peculiar to that Spring. He said it was excessively moist; that it came out warm, and then changed suddenly to cold, and he thought the climatic condition of that Spring was favorable to the growth of that fungus, and didn't think it would appear again under better and other conditions. Now, at our orchard in the Santa Cruz Mountains, we are on what is considered good fruit land. It is fifteen hundred feet above the sea, and the north winds, coming from San Francisco through the Santa Clara Valley, strike there. The orchard which is most affected is right on the summit and facing the north; there is a slight incline to the north, so that it has the full force of the north wind. The soil is a dark loam; a good deal of clay—a rich soil; but where this orchard has been affected, it is rather what is called seepy land—the water seeps through—and it is cold. Now, you take that cold, damp soil, and the excessive rainfall last Spring, and the cold winds we had, and I think they brought on that fungus growth. Just across the road, to the south, it is almost free from wind, being sheltered; and on a rich, sandy loam, with a good drainage, and no excess of moisture, the fruit is perfectly clean. So the idea that I have of it is, that in one place conditions favorable to its growth must exist, and in another they do not. A cold, damp wind, and a cold, damp Spring, and soil suitable for it, may be the conditions. I don't think it will spread, and I don't think it will appear there again. We don't always have such winds or such Springs up there.

DR. KIMBALL: My apple orchard is rather limited, but I think the gentleman's theory will not hold, particularly on my soil, because the only place, unfortunately for his theory, on my place where the blight is, is along that creek. It is a light, sandy, alluvial soil, and it appeared on the orchard there on the trees that were about nine years old. I have small orchards on another part of my place—that is, along the foot of the hill, where it is very wet. The trees, it is true, are younger there, but there is none of that disease to be seen there. It has a heavy clay soil, debris from the hill above, and at the base for two feet down, it is heavy clay, and there is excessive water in the springtime. But I noticed, as the gentleman has described, that the white Winter Pearmain is the most affected. One particular tree of the yellow Newtown pippin was so affected by it

that the fruit is entirely worthless, and it never can be cured so as to bear as it usually has. I think there is a great deal of mystery, and a great deal that will be forever hidden from us in regard to the prevalence of these fungoid diseases in plants and trees. The spores are invisible, and they seem to permeate all space, and under certain conditions and in certain seasons they spring at once into life and are very destructive. We have been especially afflicted in Alameda County, on the borders of San Lorenzo Creek. The pears have been afflicted with fungus, sufficiently so as to make the fruit unfit for the market. The Easter Beurre is a pear that has become almost entirely worthless in consequence of it. During the last two years the fungus has steadily gone from one variety of pear to another, and this year the apricot is afflicted in some localities very badly, and our Winter Nelis pears, that escaped until this year, are also badly afflicted, some trees being entirely covered with this fungoid growth. It affects the leaves of the apples and the pears, and I have seen many orchards in Eden Township where the trees were entirely denuded of leaves in consequence of it. I will state further, that I have noticed in all kinds of plants during the last two years, a tendency to take on a fungoid growth; I have noticed it on corn and all kinds of vegetation more or less. It seems to pervade almost the entire State, and I can't account for it unless it is owing to climatic influences.

MR. CADWELL: I had a little experience in that direction about eight or nine years ago: I had some white Winter Pearmains in my orchard, and we had a late rain, say about the time the cherries commenced ripening, and the white Winter Pearmains were completely spoiled. I knew about this fungus, as you call it (I call it the mildew) some time ago. I grafted those Pearmains all over, and I didn't have any more of it excepting this year. We had an uncommonly late and heavy rain this year, after which I found that the fungus had spread all over my orchard. It didn't commence at one point, it took it all in at once, excepting the Baldwin; the Baldwin trees were just as smooth and pretty as ever, though I believe I did have a little graft on a tree of the Porter apple that wasn't touched, but everything else had it, especially the yellow Newtown pippin. I attributed it to the late rain and the intense coldness of the season. My Winter Nelis pears six years ago commenced to be afflicted with this fungus, and I haven't raised a Winter Nelis pear since that time. My Bartlett pears have been affected for the last two years, and this year very badly; but they didn't throw their fruit. I heard Mr. Cooke, of Sacramento, say something about an orchard being saved by spraying it with whale oil soap and sulphur. I tried it, and put it on twice with about ten days between, but I couldn't see any effect from it.

MR. MILCO: What time of the year, please?

MR. CADWELL: It was after the rain. I saw that that wouldn't have any effect, so I thought I would try a remedy of my own. I got concentrated lye and used it in solution with soap. I didn't have any soft soap, and I took bar soap and dissolved it with the concentrated lye. I tried it too strong at first, and then I tried different solutions until I had the proper strength. Then I commenced and sprayed those pear trees all over thoroughly. I knew that I couldn't injure them any—there was nothing there to lose. Well, those pears came out so that I had a pretty fair crop, but they were

not Bartlett, they were Russet pears; so when I sent them to market I hardly dared send them as Bartlett pears. They were not really the shape of Bartlett pears; they were all shapes; they had been affected so long that they had got out of shape, and they never got into shape afterwards. So far as the Winter Nelis is concerned, I have tried many experiments, manuring, iron filings, and everything that I could get, but I came to the conclusion that there was nothing that would stand on my place but the Bartlett pears, and from the experiments that I tried with lye I think I shall use it. That is my experience. I am sorry that I can't give the strength of the solution, but it is impossible at present. That was in Sonoma County, ten miles from Petaluma. One thing that bothers me is to hear that the Baldwin apple is not a particle affected.

MR. MILCO: Speaking of the Baldwin apple, some fifteen, sixteen, or eighteen years ago we used to receive Baldwin apples from different parts of the State with something all over them like the dry rot. Now, I would like to know whether that has anything to do with this disease that we have been speaking of, or if it is a different disease altogether.

MR. CADWELL: I think I can answer that question. It is entirely with the trees. The Baldwin grown in a dry climate will not stand; it will dry from the outside down to the core. I don't consider the Baldwin, even in my locality, a very profitable apple, for it usually bears every other year, and bears very heavy the year that it does bear. It is almost impossible to get them thin enough unless you pick them off thoroughly. In regard to this fungus, there is one thing more: In Green Valley, where it is thoroughly protected, also in Richer Valley, and all that section of the country which is mostly protected from the wind, and in a locality where wind does not prevail, there is no fruit this year on account of this fungus.

MR. GRAY: There was a remark made here by two or three different ones about the Winter Nelis failing, and the report has gone through the State, or part of the State at least, to that effect. Now, I would like to know if that is generally so, for I calculate to set out a large orchard this coming Winter with the Winter Nelis. In Chico they did remarkably well; they have a crop there every year, just as sure as the year comes around. This year there are very large trees just loaded down with very large fruit; no mildew or fungus about them. The question in my mind is, whether in a few years the Winter Nelis will not also fail in that section.

MR. BROWN: I apprehend that many of the diseases that afflict our fruit trees have their day and pass away entirely. Now, for the last five or six years, in Alameda County, there has been very few Winter Nelis' raised. For several years in succession there was almost an entire destruction of them, but the crop that there was of them was comparatively free. It has been within the last few years that this fungus has taken possession. In our section of the country they have taken to grafting their trees over—the old trees and the young trees. I have only four trees left standing in my orchard.

MR. HATCH: In regard to this scab on the pear or fungus, in our locality we never have had a touch of it until this year. Then it was very bad on Easter Beurre, and some few Winter Nelis'. We laid it to the cold damp season, and supposed that to be the last of it, providing we didn't get any such season again. I would like to ask

those who have had it several seasons, if it seems to be worse in a cold damp year than in a more warm and dry one.

MR. CADWELL: I have had a little experience with the Winter Nelis. The first season we had a half or two thirds of a crop; it gradually came down after that, and they all dropped off. It bloomed as prettily as any pear tree you ever saw. At night it looked as pretty as possible, and the next morning it looked as though fire had tipped the end of the blossoms, and afterwards you could see it on the pear, and from that time the fruit would drop off until there was none left of any consequence.

MR. HATCH: Did it look as if it had been burned with fire?

MR. CADWELL: The buds take on a kind of reddish color when it strikes it, and then it dies away and the pears turn black, and then they all drop off.

MR. HATCH: When it strikes it so young, doesn't it appear like a charcoal burn?

MR. CADWELL: No, sir, not to me.

DR. KIMBALL: I think this appeared as far back as '78, '80, '81, and '82. In our section of the country it seemed to strike the bloom, and most people attributed it to the frost. I looked at it and examined it carefully with the glass. On the morning after it appeared, as this gentleman says, it looked as though there had been a frost, and the whole tree would look as if it was struck with blight, but it didn't affect anything the first two or three years except the blossoms. Last year it not only affected the blossoms, but the leaves, and the leaves appeared as if there had been a fire there, on about three fourths of the trees, and some trees almost entirely. In our section there have been rather more Winter Nelis' than usual this year. I noticed some orchards where they hadn't the disease, and even where they had, there was quite a sprinkling of Winter Nelis', and that leads me to conclude that it is the same disease that they have. I think that climatic influences affect this fungus and enable it to be more fruitful in some seasons than it is in others.

MR. AIKEN: Last year I had some Winter Nelis trees and had a very fair crop of fine large pears; I sent them down to Porter at San José to send to Chicago, and he told me that they were very good, as good as he had seen. Those very trees this year had none at all on them. They looked well enough to start with and blossomed well, but this blight seemed to wilt and destroy the leaves. I think it must be owing to climatic influences; I can see no other reason. The Winter Nelis pear, if it can be raised in a fine, large condition, free from blight, is a profitable fruit, because they pay even more for it than the Bartlett. The question is, can we raise it without suffering year by year from this blight. The Easter 'Beurre this year will do well; the Bartlett is reasonably fair, not quite as good as usual. It seems to be the only pear that comes through in marketable condition.

MR. C. WEST: I knew of this blight, as we call it, in '80 and '81. It attacked our trees the same as has been mentioned here, but then I believed it to be owing to the very cold wet Spring we had. It is almost the same as the potato blight in that respect. In England when we have a very wet and cold Summer we are sure to have a potato blight, but we don't have it in a dry Summer. Now, so far as my experience goes, I think it is owing to the climate, but I should

say that my experience don't go for much, as I only raise the young trees, and don't grow fruit.'

MR. WHITE: It seems to me that it must be the climate. Take it in the foothills, our Winter Nelis' were very fine this season and last season. They are surer than the Bartlett with us, and we haven't seen or heard anything of the blight in the foothills. It seems to me that it is confined to the Coast Range, and I think that the temperature has something to do with it.

MR. HATCH: I would say that I have that opinion for this reason: In our locality we have never had such a damp cold season since I have been there. It was similar to the climate nearer the coast. Seven years ago I saw this same blight in Mr. Llewellyn's orchard to such an extent that I didn't recognize the Bartlett pears, and I asked what variety of pears they were. My opinion is, that the reason that we don't have this trouble is because we don't have the moisture in the air or the low degree of temperature that they are subject to in that locality. This year our climate was similar to theirs, and we had the same results to some extent. It didn't attack the Bartlett at all, but the Easter Beurre suffered very seriously, and the Winter Nelis was attacked to a very limited extent.

Upon motion, the convention fixed upon Friday afternoon for discussion upon the subject, of what localities of the State were best suited to different kinds of fruits, and also upon what stocks our fruits could best be worked. The convention then adjourned until half-past one o'clock P. M.

AFTERNOON SESSION—FRIDAY.

The convention met at half-past two o'clock, Vice-President Hatch in the chair. The morning's discussion was resumed.

STOCKS FOR BUDDING.

DR. KIMBALL: It seems to be pretty clearly settled that we can grow fruit of almost every variety in different parts of the State, if the variety is suited to the locality. Now I would like to say a word in regard to stocks. I have been engaged in a certain way in the nursery business for the last seventeen or eighteen years, and this subject of stocks and their growth, as far as their adaptation to different localities is concerned, has been a matter of surprise to me each year. Each year I have learned something new in connection with it.

In olden times plums were grafted entirely on seedling stocks, or many of our nurserymen propagated them on suckers that came up around the roots of plum trees that were growing in the orchard. As a consequence, all over the State—I speak now of seven, eight, or ten years ago—all the plums and prunes nearly were growing on plum stocks, and the plum orchards and prune orchards were one mass of suckers. There has been some double working. I have done double working on the peach with the Imperial gage and other varieties. It has been practiced quite extensively the last few years, of working some varieties of plums and prunes direct on the almond stock. There are some varieties of plums and prunes that will not do well on almond stock, but they work the Imperial gage and Yellow plum or gage. Also, in connection of this working of these

stocks on the almond, in the inter-counties, where it is hot, and the interior valleys, the prune and some varieties of plums cannot be grown with success, direct on the plum or root, from the fact that the plum root is better adapted to our coast counties, where we have a cooler climate and cooler soil; where the sun is not so hot.

MR. MILCO: I want to ask Dr. Kimball to give us a definite idea of his own on the subject of budding apricots on almonds, because I budded some last year, and they were a failure. I find they all break off, so far as my experience goes.

DR. KIMBALL: I ascertained that same thing years ago, and I ascertained it from attempting to bud all kinds of plums on the peach. I found that the Imperial gage and the Petite prune would bud on the peach, and the Yellow egg or the Washington will not grow on the peach. I found that the Yellow egg and the Imperial gage made a perfect union on the almond. The Petite prune and a dozen other varieties do well. But about budding the apricot on the almond, I apprehend there will be real gnashing of teeth during the coming years, among orchardists who have bought trees budded direct on almond stock. I presume there must have been two hundred thousand or three hundred thousand apricot trees distributed by nurserymen in this State that were budded direct on almond stock, and the result will be disastrous; if they were grafted, they will be far preferable to being budded. They will hang on a little longer, but that kind of tree will grow less and less every year, until there will be none left. There are some kinds of plums that are grafted on the almond that will not grow budded on the almond.

PROF. DWINELLE: What do you think of budding the French prune upon the apricot?

DR. KIMBALL: It grows very well; in fact, most kinds of plums and prunes do extraordinarily well on the apricot. The only disadvantage that I find with the apricot is, it has a soft, spongy root, and it doesn't stand water as well as the peach or the almond, and another disadvantage is that gophers have a wonderful affection for the root.

MR. HATCH: How about the lemon?

DR. KIMBALL: Gophers are excessively fond of orange roots, but they will hardly ever touch the lemon. I have orange trees that I have been trying to get up for several years, and they girdle them nearly every year underground.

PROF. DWINELLE: Have you had experience with the Washington plum on the almond?

DR. KIMBALL: Some years ago I experimented with forty or fifty, and some of them did finely, but as a rule, I consider it is not a fit union. The Washington plum can be grafted on old almond trees by oblique grafting, but if there is not much affinity the scion will not take hold, when by oblique grafting it will grow up or by budding it will grow up.

MR. GRAY: I have had a little experience with the almond, and I found not only gophers, but wire worms were very fond of them. The trees they never troubled much, but last Summer the wire worms went through the rows where there were almonds planted, and they would bore right through the soil to get at the kernel, until they spoiled about half that we had planted before the tree became rooted enough to live without the kernel, and as Dr. Kimball has

said, it is not safe to root those. A great many of our trees broke off and had to be worked over, and quite a good many were destroyed.

DR. KIMBALL: In regard to protecting young almond stocks when they are first started, when the pits are sprouting, to make a success, you want to cultivate the mole; they are not after the roots; they are after the wire worm. When you plant them in rows and have them perfectly straight, my experience has been the mole will go through and pick out every one.

MR. GRAY: I have heard it recommended to put potatoes down. They took a stick and put a piece of potato on it, and put it down in the rows, and the wire worms would go down, and once in awhile they would pull up the stick and destroy a large quantity of them.

MR. SHAW: I have had more trouble in growing the almond, on account of the gophers, than anything else. When they get started in a row they will take out fifty or sixty trees in a couple of days, just as easy as anything.

DR. KIMBALL: I will inquire if those almonds were just coming up from the seeds or pits planted?

MR. SHAW: No, sir; they would be two feet high. Sometimes I would think there wasn't a gopher on the place, and would go off, and when I came back I would find fifty or sixty trees right along, dried up.

MR. COATES: I find the gophers usually eat the sweet almond, and they don't trouble the bitter almond so much; they took out but very few of them. I noticed this year that they would occasionally bite through a bitter almond seedling when they went along the road; then they would apparently leave it and go to something else.

MR. HATCH: I got seven sacks of bitter almonds to raise stocks to graft almonds upon, and they grew very nicely, and after they were budded the buds were taken. There were some peaches in the row, and they would go around the peaches and eat those almonds, and I got only about two hundred out of those seven sacks.

MR. HIXSON: The gophers have been very bad with my apricots, but my almonds they haven't disturbed at all. The almonds I got from Mr. Shinn's nursery, and I would like to ask him what they were budded on. I got them in 1879. They were Lanquedocs.

MR. SHINN: I am not able to say; I haven't noticed a special liking for the almond root by the gopher in preference to the peach.

MR. AIKEN: I would like to ask if the gopher will take the root after it arrives at four or five or six years of age? We had about two hundred and fifty almond trees that grew very nicely, and I don't remember that we lost one of them by the gopher. I grafted them over when about two or three years old into Egg plums, and the connection was very perfect, and they have done very well. So far as my observation goes, they don't take the almond root after it arrives at maturity and strength.

DR. KIMBALL: Mr. William McKee, on San Lorenzo Creek in Alameda County, planted I presume nearly one hundred acres in plums and prunes, and they were all marked or double marked on the almond, and I believe it would be difficult to find anywhere in the State a finer growing orchard than that is now. I don't remember seeing a single tree destroyed after arriving at any age, by the gophers.

PROF. DWINELLE: I have had no experience as a nurseryman, but I have observed a good deal on this very point within the last few years, and I have had some personal experience in a small way.

What I have to say would be mainly to confirm some points that others have brought out, and present one or two new ones. I long ago found that the almond would not do as a stock for the apricot. I found that out long before it came to be such a prominent question as it is to-day. Another point is, that as a rule, those that I have asked about gophers attacking the apricot root, a large majority have said that they would not have the apricot root under any consideration, if gophers were numerous, because they would kill the tree, or wound it, and then the larvæ of certain large beetles would attack it and complete the destruction. But as to the gopher question, it strikes me that we should consider as whether there were many gophers on the particular piece of land that we are talking about.

I asked particularly about the Washington plum because I consider it one of the very best plums, and because I wanted Dr. Kimball's observations on that point. I have myself seen a most marked example of failure at Santa Rosa in grafting the Washington plum, and its reputed parent, the true green gage, on some old almond trees, while the French prune was a perfect success. Mr. J. Routier, whom many of you know is a very practical fruit raiser, showed me at his home near Sacramento what he called a peach almond. It was a fine large vigorous tree, having the general appearance of a fine almond tree; the leaf, in the main, more like that of an almond than a peach, with the stone of a peach, and the pulp and skin were a curious cross between the peach and almond. It was worthless as a fruit, and he told me it was the very finest as a peach stock. The peach trees grown upon this as a stock had straight smooth stems, and fine spreading tops, showing a perfect union, but curiously enough, if the almond was worked in the same kind of stock there was a bulge in the stem, which was larger above the point of union than below. I should say, as Mr. Routier did, that it was one of the most valuable stocks in the State, particularly for the peach.

MR. COATES: We have one tree in Napa Valley, in an old orchard of trees, which answers exactly the description of Professor Dwinelle. It opens like the almond, though the pit is like the peach.

MR. SHAW: I have a tree of the same kind, only it has a different pit. The pit is like an almond; it is smooth and hard, so that you can hardly break it with a hammer. My boy, who is eighteen years old, contended that it was a peach, and I maintained it was an almond. I haven't tried it as a stock, but I think it would be good.

MR. AIKEN: I wish to ask if the peach does well worked on the almond. I grafted some, but I never liked the taste very well. They appeared to be kind of bitter, like the almond. I found that they were not much of a success, and I grafted them over into egg plums, and I liked them better.

DR. CHAPIN: I have peach trees worked on the almond in bearing. In making experiments for other purposes, I ascertained the Foster peach on the almond produced a very choice fruit, better than any peach in the same orchard. The Foster peach is considered a great success worked on almond stock. I was about to speak of a tree of the character that Prof. Dwinelle and others have spoken of, that came under my observation. That was many years ago, in Jacksonville. It was an almond tree, without any question whatever, having a pit somewhat similar to a peach, but the pit was thick in accordance with the grain of the peach pit, and with a very large, fine, thick, juicy pulp, and fine flavor. It was delicious to eat as a

peach. When it got fully ripe, it split down. I found that tree was the resort of the children, over quite an extensive neighborhood.

PROF. DWINELLE: I will say that I had a very fine box of peaches sent me a year or two ago, from near Huntersville. The gentleman sending them said he had planted an almond orchard on peach roots, and not finding it profitable, he had double-worked them, and had grafted peaches on this almond stock. The result was, as I could judge from what he sent me, the very finest quality of Alexander and Briggs' May peaches, and those that tasted them said that they were the very best that they had had in California.

DR. KIMBALL: I would suggest that in order to raise a good peach, that you would have to go down a little lower in the valley. It is not so much the fault of the root, as a good location. Now, where you can raise a very good apple, you would have to choose some other soil to raise a good peach, whether on the peach root or the almond root. The fault is more in the location than it is in the stock.

MR. AIKEN: I will say in reply to Dr. Kimball, that it may, to a certain extent, be so, but we raise a very fine Mountain Early Crawford peach; there is no question about that. I think that Dr. Chapin will agree to that.

MR. —: I think that it has been customary with nurserymen to gather up peach pits of most any kind. We have had orders from Chico and various parts of the State, wanting two, three, or four tons of peach pits by nurserymen, and they seem to be satisfied to take most anything that we send them, although, of course, they only expect that a certain per cent of them will grow. We have a kind of peach that is very good, called the Howard peach. They can't be used for everything, any time of the year, but as they come in very late, they can be used to advantage. The meat is thin and dry, and there is little use for it, still, it makes the best nursery stock of anything in the peach line, that I have ever seen. The tree is straight, healthy, and strong. I don't know where it came from; it was a seedling that I think came from the Alexander some years ago. We have quite a number of trees, and are raising them just for the pits.

DR. CHAPIN: There is one thing further in reference to the kind of peach pits which should be used for nursery stock. The freestone peach should always be used, and not the cling for certain grafts. The prune will not do well on clingstone peach pits for stock, but the freestone makes a perfect union, and is the most desirable perhaps, for stock, in many localities.

SATURDAY'S PROCEEDINGS.

The day was taken up by discussion upon various fruit pests, insect and others, and participated in by many members of the convention. Before the close of the afternoon session and the final adjournment of the convention, Mr. Aiken called up the resolution for a committee to urge the establishment of a professorship of entomology, which was passed, and on motion the Chair appointed a committee of five, viz.: W. H. Aiken, R. J. Trumbull, F. C. DeLong, S. F. Chapin, A. T. Hatch. On motion Dr. E. Kimball was added to the committee.

DR. KIMBALL moved the following: The thanks of this convention are tendered to the Chamber of Commerce for the use of its hall during this session.

On motion the convention adjourned sine die.

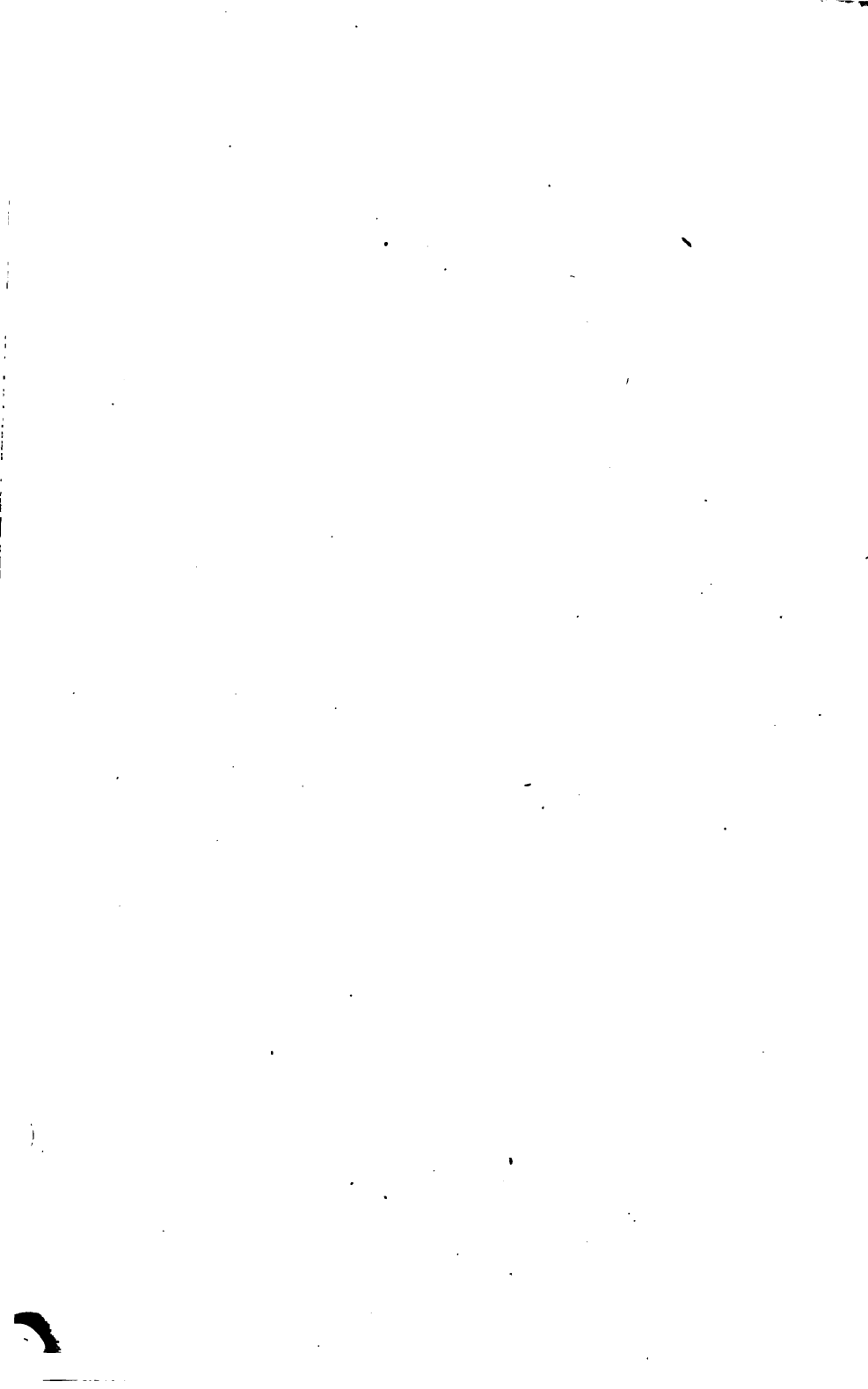
s
e
r
d

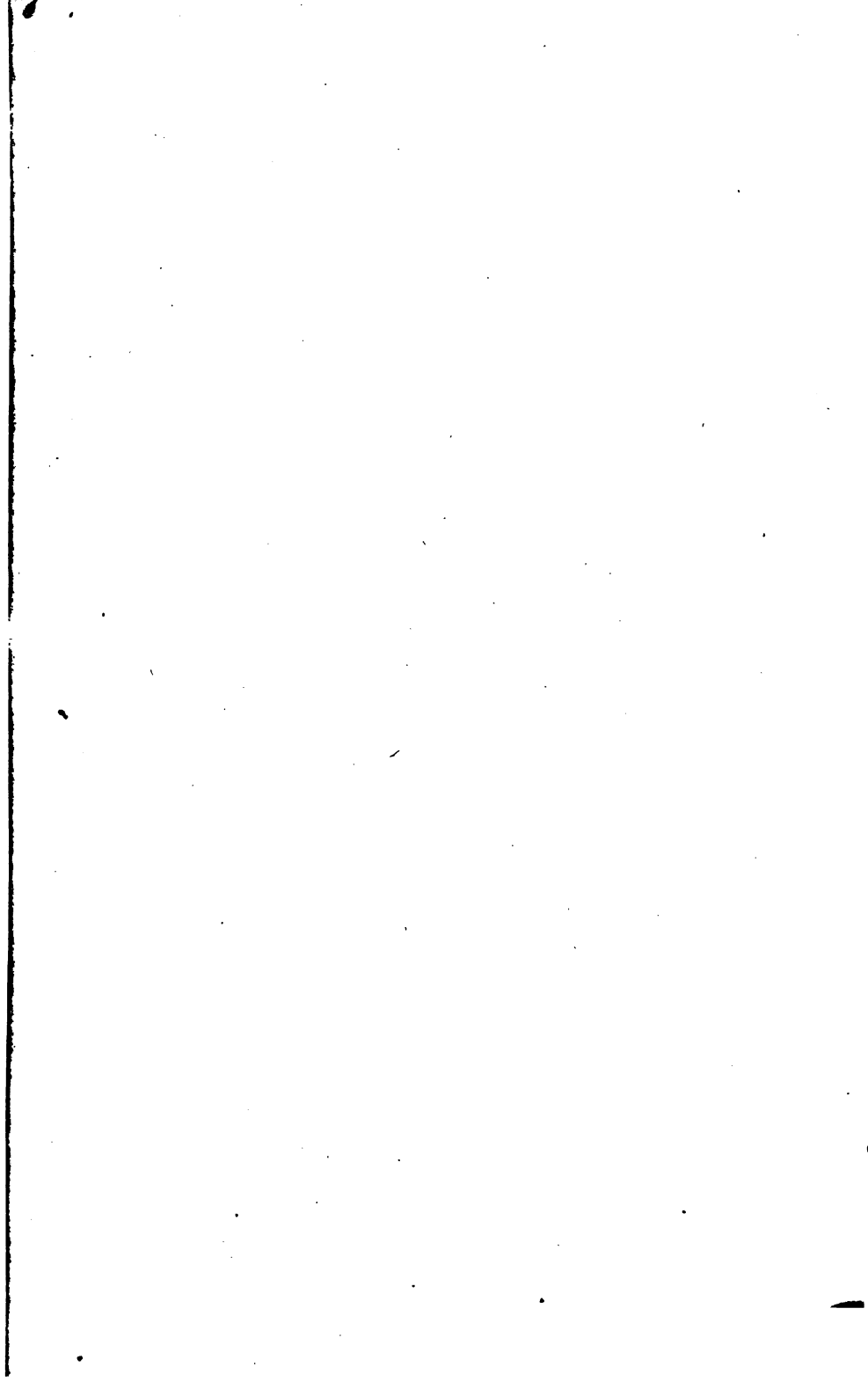
a
v-
n

en
m
ns
ke
ly
nd
be
ry
nd
ny-
ht,
ed-
ave

nd
one
fts.
but
ber-

sect
ion.
ment
mit-
nich
five,
l, A.
ttee.
tion
dur-





STORED AT NRLF

THE UNIVERSITY LIBRARY
UNIVERSITY OF CALIFORNIA, SANTA CRUZ

This book is due on the last **DATE** stamped below.

50m-6,'67(H2528s8)2878

